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UK METEOROLOGICAL OFFICE GLOBAL DATA MONITORING REPORT

April, 94

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIBU observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12 UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of AIREP/ASDAR reports received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 ms^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 5-8 show wind statistics for AIREP/ASDAR in the layer 70-500 hPa. Observations with a vector wind difference > 60 $m s^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (ms^{-1})
7	RMS observation-background vector (ms^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-12. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from Bracknell global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias| ≥ 4 hPa (pressure),
≥ 5 $m\ s^{-1}$ (wind speed),
≥ 30 degrees (direction).

2.SD ≥ 6 hPa (pressure),
≥ 80 degrees (direction).

3.PGE ≥ 25

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA-LEVEL PRESSURE									
C6BT8	ALL	MSLP	SUR	40	1	2	1.6	4.9	5.2
C6KB6	ALL	MSLP	SUR	24	0	0	2.1	4.8	5.2
ELFN7	ALL	MSLP	SUR	24	1	4	2.1	5.9	6.2
ELIU4	ALL	MSLP	SUR	28	1	4	2.7	-6.3	6.9
UBSR	ALL	MSLP	SUR	33	1	3	3.3	-4.2	5.3
UGWB	ALL	MSLP	SUR	35	0	0	2.2	8.2	8.5
UUOD	ALL	MSLP	SUR	33	0	0	2.2	6.9	7.2
UYKD	ALL	MSLP	SUR	40	17	42	6.3	2.6	6.8
VRUA4	ALL	MSLP	SUR	57	0	0	1.1	4.8	5.0
WCZB	ALL	MSLP	SUR	27	0	0	1.2	7.4	7.5
WE4879	ALL	MSLP	SUR	29	0	0	1.5	-4.0	4.3
ZTHP	ALL	MSLP	SUR	21	0	0	2.2	-4.5	5.0
3EAY5	ALL	MSLP	SUR	20	0	0	1.1	-4.9	5.0
3EYY8	ALL	MSLP	SUR	22	0	0	2.7	-4.3	5.1
3FBK	ALL	MSLP	SUR	78	0	0	1.3	9.3	9.4
62302	ALL	MSLP	SUR	48	19	40	1.6	0.9	1.8
WIND SPEED									
D5AN	ALL	SPEED	SUR	30	0	0	3.0	6.3	7.0
ELLE9	ALL	SPEED	SUR	85	0	0	4.8	9.1	10.3
FNIH	ALL	SPEED	SUR	95	0	0	4.7	6.5	8.0
J8EJ8	ALL	SPEED	SUR	40	1	2	3.7	6.0	7.0
LEQZ3	ALL	SPEED	SUR	20	0	0	2.5	5.0	5.6
PFRX	ALL	SPEED	SUR	45	0	0	4.5	5.2	6.9
PJGK	ALL	SPEED	SUR	22	0	0	3.8	11.7	12.3
P3LE5	ALL	SPEED	SUR	23	0	0	3.1	-6.8	7.5
UTOL	ALL	SPEED	SUR	21	0	0	2.9	5.4	6.1
WIND DIRECTION									
CG2614	ALL	DIRN.	SUR	41	0	0	44.4	38.9	59.0
UYKD	ALL	DIRN.	SUR	29	0	0	87.2	-31.3	92.7
42027	ALL	DIRN.	SUR	133	0	0	86.9	-32.4	92.8
42030	ALL	DIRN.	SUR	120	0	0	42.1	-37.6	56.5
45007	ALL	DIRN.	SUR	79	0	0	22.5	-30.9	38.2
46131	ALL	DIRN.	SUR	39	0	0	47.7	-40.9	62.8
46147	ALL	DIRN.	SUR	99	0	0	24.9	-37.3	44.9
51011	ALL	DIRN.	SUR	31	0	0	31.9	-53.3	62.1
63006	ALL	DIRN.	SUR	235	0	0	50.7	-30.8	59.3
64043	ALL	DIRN.	SUR	127	1	1	103.6	-90.7	137.6

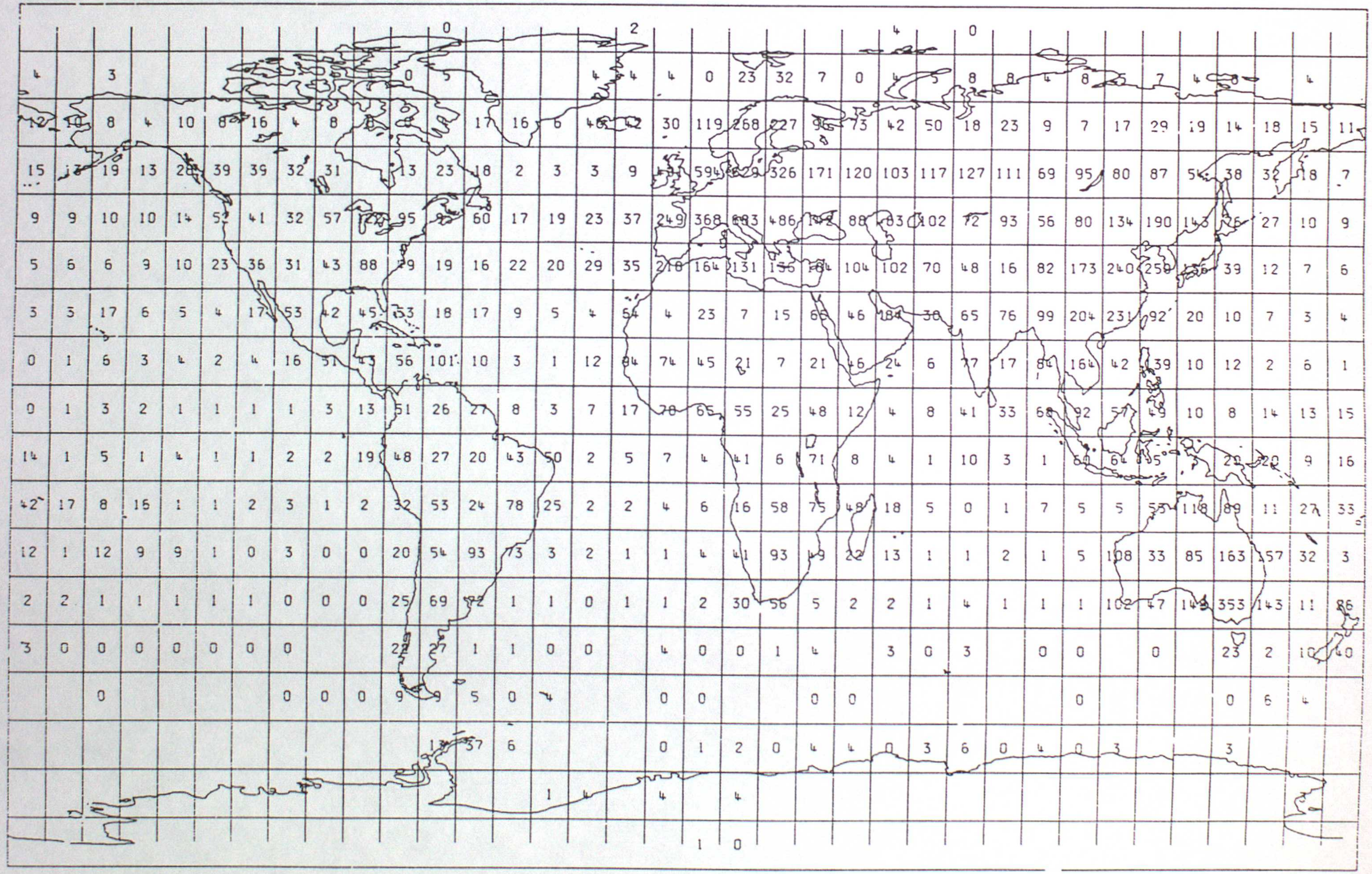
AVAILABILITY - SHIP/SYNOP - APRIL 1994

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 18891

FIGURE 1



											0					2							4		0										
4		3								0	5				4	4	4	0	23	32	7	0	4	5	8	8	4	8	5	7	4	8		4	
12	10	8	4	10	8	16	4	8	8	8	9	17	16	6	46	42	30	119	268	227	96	73	42	50	18	23	9	7	17	29	19	14	18	15	11
15	13	19	13	28	39	39	32	31		13	23	18	2	3	3	9	43	594	629	326	171	120	103	117	127	111	69	95	80	87	54	38	32	18	7
9	9	10	10	14	52	41	32	57	122	95	92	60	17	19	23	37	249	368	683	486	142	88	483	102	72	93	56	80	134	190	143	26	27	10	9
5	6	6	9	10	23	36	31	43	88	29	19	16	22	20	29	35	218	164	131	155	184	104	102	70	48	16	82	173	240	258	136	39	12	7	6
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14	1	5	1	4	1	1	2	2	19	48	27	20	43	50	2	5	7	4	41	6	71	8	4	1	10	3	1	60	64	55		20	20	9	16
42	17	8	16	1	1	2	3	1	2	32	53	24	78	25	2	2	4	6	16	58	75	48	18	5	0	1	7	5	5	55	118	89	11	27	33
12	1	12	9	9	1	0	3	0	0	20	54	93	73	3	2	1	1	4	41	93	49	22	13	1	1	2	1	5	108	33	85	163	157	32	3
2	2	1	1	1	1	1	0	0	0	25	69	72	1	1	0	1	1	2	30	56	5	2	2	1	4	1	1	1	102	47	149	353	143	11	86
3	0	0	0	0	0	0	0			22	27	1	1	0	0		4	0	0	1	4		3	0	3		0	0		0		23	2	10	40
		0					0	0	0	9	9	5	0	4			0	0			0	0						0				0	6	4	
											13	37	6				0	1	2	0	4	4	0	3	6	0	4	0	3			3			
														1	4		4		4																
																		1	0																

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA :NOBS $\geq$ 20 , and one or more of the following:

1.|bias| $\geq$ 4 hPa (pressure),
$\geq$ 5 $m\ s^{-1}$ (wind speed),
$\geq$ 30 degrees (direction).

2.SD $\geq$ 6 hPa (pressure),
$\geq$ 80 degrees (direction).

3.PGE $\geq$ 25.

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA-LEVEL PRESSURE											
25561	56.3	-24.1	ALL	MSLP	SUR	192	0	0	2.4	7.1	7.5
56509	-47.7	-172.8	ALL	MSLP	SUR	91	85	93	1.5	-11.5	11.6
65581	57.1	-40.0	ALL	MSLP	SUR	22	2	9	2.5	10.7	11.0
WIND SPEED											
44768	51.5	-38.1	ALL	SPEED	SUR	136	1	1	4.0	-9.6	10.4
44769	54.0	-31.4	ALL	SPEED	SUR	109	0	0	4.5	-11.2	12.1
44771	52.3	-26.7	ALL	SPEED	SUR	55	1	2	3.1	-10.7	11.1
62696	59.6	-18.3	ALL	SPEED	SUR	43	1	2	3.7	-13.0	13.6
WIND DIRECTION											
44768	51.5	-38.1	ALL	DIRN.	SUR	112	1	1	71.0	98.2	121.1
44769	54.0	-31.4	ALL	DIRN.	SUR	102	0	0	45.5	85.5	96.9
44771	52.3	-26.7	ALL	DIRN.	SUR	53	1	2	65.9	81.9	105.1
55578	-34.4	179.0	ALL	DIRN.	SUR	178	0	0	87.2	-10.6	87.8
62696	59.6	-18.3	ALL	DIRN.	SUR	42	1	2	66.4	96.3	117.0

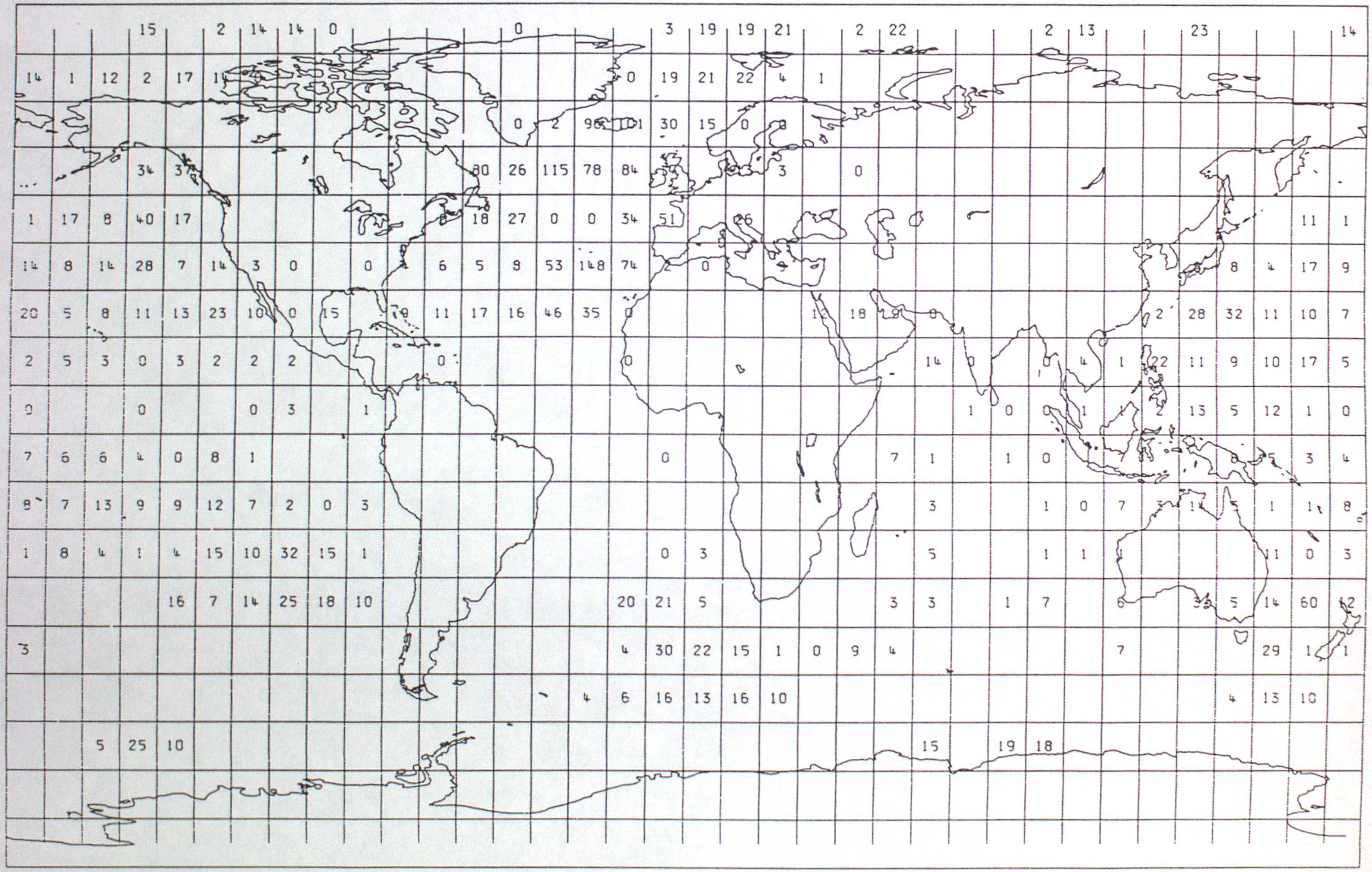
AVAILABILITY - DRIBU - APRIL 1994

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 3112

FIGURE 2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14 1 12 2 17 14 0 19 21 22 4 1
0 2 96 101 30 15 0 0
34 37 80 26 115 78 84 3 0
1 17 8 40 17 8 18 27 0 0 34 51 26 11 1
14 8 14 28 7 14 3 0 0 6 5 9 53 148 74 2 0 8 8 4 17 9
20 5 8 11 13 23 10 0 15 19 11 17 16 46 35 0 12 18 19 0 2 28 32 11 10 7
2 5 3 0 3 2 2 2 0 0 14 0 0 4 1 22 11 9 10 17 5
0 0 0 3 1 1 0 0 1 1 2 13 5 12 1 0
7 6 6 4 0 8 1 0 7 1 1 0 8 5 3 4
8 7 13 9 9 12 7 2 0 3 3 1 0 7 3 14 1 11 8
1 8 4 1 4 15 10 32 15 1 0 3 5 1 1 1 11 0 3
16 7 14 25 18 10 20 21 5 3 3 1 7 6 35 5 14 60 12
3 4 30 22 15 1 0 9 4 7 29 1 1
4 6 16 13 16 10 4 13 10
5 25 10 15 19 18

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flaggled.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)

SELECTION CRITERIA :NOBS ≥ 20 ,and one or more of the following:

1.|bias| ≥ 4 hPa
2. SD ≥ 6 hPa
3.PGE ≥ 25.

Note:- **For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.**
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	116	0	0	96	1.0	5.1	5.2
60468	35.6N	6.2E	1052	S8	108	108	100	32	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	116	116	100	100	0.0	0.0	0.0
60571	31.6N	2.2W	773	S8	114	0	0	26	1.1	-4.8	4.9
60670	24.6N	9.5E	1054	S8	80	1	1	98	1.1	8.2	8.3
61731	13.3N	14.2W	4	M	37	0	0	100	1.4	-4.5	4.7
63333	11.1N	39.7E	1916	MS	46	0	0	91	3.5	7.3	8.1
63402	7.7N	36.8E	1577	MS	58	34	59	95	2.4	-13.5	13.7
63453	8.8N	39.8E	1062	S	65	1	2	100	1.4	12.2	12.3
63474	7.1N	40.0E	2450	S	39	38	97	3	0.0	-12.2	12.2
63478	5.1N	44.6E	320	MS	45	0	0	51	2.4	6.9	7.3
64503	3.4S	10.7E	34	M	78	0	0	74	1.4	-5.5	5.7
64507	2.9S	11.0E	79	M	86	0	0	94	1.5	-6.9	7.1
64911	5.0N	9.9E	821	8	70	0	0	26	1.5	-4.1	4.4
67022	14.7S	49.6E	474	MS	37	37	100	0	0.0	0.0	0.0
68014	19.6S	18.1E	1411	S8	90	0	0	86	2.1	-6.0	6.4
68396	26.5S	31.3E	641	S8	41	0	0	29	1.0	4.0	4.1
68752	32.8S	27.4E	524	S8	91	0	0	100	1.1	-8.2	8.3

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
25902	60.8N	151.8E	797	MS	55	23	42	96	0.9	-13.7	13.7
29999	52.5N	99.8E	1570	S8	92	88	96	92	11.4	3.5	11.9
30554	54.5N	113.6E	995	MS	56	2	4	100	1.3	11.5	11.6
38613	40.9N	72.9E	771	MS	56	2	4	2	2.3	4.2	4.8
38615	40.5N	72.8E	887	M	47	0	0	0	2.2	4.2	4.7
38696	39.6N	66.9E	675	MS	59	0	0	83	1.0	-4.6	4.7
38836	38.6N	68.8E	824	MS	55	2	4	4	1.3	4.9	5.1
40356	31.7N	38.7E	818	S8	112	0	0	69	0.9	-5.1	5.2
40376	27.6N	38.6E	860	MS	71	71	100	0	0.0	0.0	0.0
40432	25.8N	42.0E	783	MS	71	71	100	0	0.0	0.0	0.0
40450	23.7N	44.6E	1080	MS	71	71	100	0	0.0	0.0	0.0
40701	39.3N	44.4E	1470	MS	58	0	0	91	1.1	7.0	7.1
40723	37.5N	57.3E	1074	MS	102	1	1	14	1.3	-4.2	4.4
40726	36.8N	45.7E	1385	MS	98	1	1	71	1.7	5.0	5.3
40743	36.2N	57.7E	941	MS	112	3	3	25	1.4	-5.0	5.2
40762	35.3N	59.2E	1333	MS	108	20	19	99	1.5	-13.1	13.2
40763	35.2N	58.5E	1060	MS	29	3	10	10	1.3	-5.7	5.8
40783	32.4N	49.7E	1972	M8	30	2	7	87	1.4	-6.1	6.3
40789	33.8N	55.1E	921	MS	41	0	0	100	3.1	7.8	8.4
40836	30.8N	51.7E	1880	MS	56	1	2	95	1.5	7.6	7.7
40859	29.0N	53.7E	1383	MS	74	2	3	99	1.2	9.0	9.1
41035	21.3N	40.3E	2089	S7	38	38	100	0	0.0	0.0	0.0
41254	23.1N	57.7E	1755	M	59	59	100	97	0.0	0.0	0.0
41396	16.0N	48.9E	700	MS	41	1	2	63	1.9	6.6	6.9
41466	13.7N	44.1E	1385	S8	20	1	5	85	1.2	-6.2	6.3
44232	49.4N	102.7E	933	MS	92	0	0	21	2.3	-4.0	4.6
44241	48.9N	106.1E	807	MS	70	1	1	94	2.5	-9.1	9.4
44277	46.4N	96.3E	2147	MS	97	0	0	0	1.8	-5.3	5.6
44292	47.9N	107.0E	1338	MS	105	1	1	0	1.2	4.4	4.6
44416	28.6N	81.6E	720	MS	54	2	4	0	1.4	5.0	5.2
44477	27.0N	87.4E	1445	S8	58	57	98	98	0.0	8.3	8.3
51467	42.7N	86.3E	1753	S	116	0	0	0	2.5	6.2	6.7
52602	38.8N	93.4E	2734	S	119	1	1	0	2.8	-6.4	7.0
52866	36.7N	101.8E	2296	S	119	0	0	30	1.8	5.2	5.5

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
56287	30.0N	103.0E	629	M	120	0	0	44	2.1	4.9	5.3
56444	28.5N	98.9E	3488	S	117	116	99	99	0.0	3.2	3.2
56462	29.0N	101.5E	2994	S	109	1	1	0	2.6	6.1	6.6
57622	28.9N	107.2E	1907	S	103	9	9	0	1.5	-10.8	10.9
57816	26.5N	106.7E	1222	MS	118	114	97	100	0.7	14.1	14.1

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	M	36	1	3	69	1.7	-4.9	5.2
82287	2.9S	41.6W	22	MS	48	3	6	67	4.0	-7.5	8.5
82336	3.1S	58.4W	48	MS	59	0	0	37	3.6	4.3	5.6
83235	12.3S	46.4W	660	MS	31	1	3	84	0.7	6.2	6.2
83332	14.1S	46.4W	950	MS	63	16	25	100	0.8	13.7	13.7
83423	16.7S	49.3W	729	MS	64	0	0	33	1.1	-4.9	5.0
83488	17.8S	42.9W	1097	MS	58	58	100	100	0.0	0.0	0.0
83531	18.6S	46.5W	896	MS	64	0	0	86	1.0	-6.9	7.0
83587	19.8S	43.9W	850	MS	73	0	0	0	2.3	-7.5	7.8
83689	21.3S	43.8W	1171	MS	54	1	2	96	0.9	5.3	5.4
83704	22.3S	53.9W	369	MS	61	1	2	98	1.9	-9.5	9.7
83736	22.1S	45.0W	900	MS	20	0	0	75	1.2	4.2	4.4
83811	24.4S	50.8W	808	M	54	0	0	72	1.9	4.9	5.3
83953	30.9S	55.5W	231	M	38	0	0	79	3.7	-5.5	6.6
84401	5.2S	80.6W	50	MS	92	0	0	0	1.8	4.8	5.1
84425	5.9S	76.1W	184	MS	52	0	0	0	3.4	6.2	7.1
84455	6.5S	76.4W	282	MS	45	0	0	2	2.6	5.1	5.7
84472	7.1S	78.5W	2622	S	52	3	6	88	1.3	-7.1	7.2
84531	9.2S	78.5W	21	MS	55	1	2	0	1.1	4.9	5.0
84658	12.6S	69.2W	266	MS	81	0	0	0	2.7	5.7	6.3
84686	13.6S	72.0W	3249	S	114	1	1	16	2.5	-5.1	5.7
84782	18.1S	70.3W	469	MS	91	0	0	0	1.6	5.0	5.2
85201	16.5S	68.2W	4071	S	111	0	0	0	2.7	4.6	5.3
85230	17.6S	69.4W	4057	S	42	0	0	17	1.6	4.8	5.1
85406	18.3S	70.3W	58	M	116	0	0	0	1.4	5.5	5.7
85418	20.5S	70.2W	48	M	114	0	0	0	1.5	4.0	4.3
87046	24.4S	65.1W	905	S8	102	102	100	0	0.0	0.0	0.0
87322	31.3S	66.6W	658	MS	79	79	100	0	0.0	0.0	0.0

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
76118	30.4N	109.7W	1040	MS	37	2	5	97	1.1	-9.9	10.0
76373	25.3N	105.8W	1967	MS	75	70	93	99	0.7	14.0	14.0
76539	22.1N	101.0W	1871	MS	89	1	1	85	1.0	-5.3	5.4
76632	20.1N	98.7W	2417	MS	62	0	0	97	1.2	-6.7	6.8
76726	18.9N	99.3W	1560	MS	87	2	2	98	1.2	-8.8	8.9
76750	18.5N	88.3W	3	MS	98	0	0	19	1.4	-4.2	4.4
76762	17.5N	99.5W	1360	MS	71	4	6	96	1.4	10.9	11.0
76848	16.3N	92.1W	1530	MS	89	6	7	100	1.0	-13.4	13.4
78397	18.1N	76.9W	786	MS	112	112	100	0	0.0	0.0	0.0
78501	17.4N	83.9W	11	M	104	78	75	0	12.5	-3.6	13.0
78795	8.1N	81.0W	88	MS	61	0	0	30	1.7	4.6	4.9

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
98432	14.1N	121.1E	11	M	110	0	0	71	1.2	-4.1	4.3

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01245	62.6N	9.7E	630	MS	89	0	0	87	1.5	-5.5	5.7
01446	59.6N	8.3E	804	MS	87	0	0	100	1.0	11.2	11.2
08221	40.5N	3.6W	633	MS	102	0	0	91	1.4	5.8	6.0
11021	49.0N	15.0E	561	MS	116	0	0	54	1.1	4.1	4.2
15052	47.4N	25.6E	1541	S8	106	0	0	0	1.4	-4.8	5.0
16020	46.5N	11.3E	1461	MS	91	91	100	0	0.0	0.0	0.0
16614	40.4N	21.3E	604	MS	88	1	1	99	1.3	-7.5	7.6
17084	40.6N	35.0E	837	MS	115	0	0	97	1.3	7.0	7.1
17260	37.1N	37.4E	855	MS	115	114	99	100	0.0	14.6	14.6
40184	31.8N	35.2E	809	S8	120	0	0	99	1.3	6.2	6.3

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89757	73.8S	55.7E	2775	S7	72	72	100	97	0.0	0.0	0.0
89803	68.5S	102.2E	2118	S7	83	3	4	54	2.5	-9.2	9.5
89805	74.1S	109.8E	3070	S7	85	23	27	13	4.6	-1.7	4.9
89811	66.7S	112.9E	1362	S8	93	1	1	71	2.5	-9.7	10.0
89828	74.5S	123.0E	3280	S7	106	19	18	25	3.1	5.5	6.3
89832	66.7S	139.8E	240	MS	69	69	100	100	0.0	0.0	0.0
89860	74.2S	160.3E	1772	S8	101	0	0	6	3.1	-5.8	6.6
89861	74.5S	160.5E	1525	S8	105	1	1	15	2.8	-7.7	8.2
89863	74.9S	163.1E	30	MS	102	3	3	20	3.5	-4.3	5.5
89868	79.9S	169.8E	60	MS	108	108	100	100	0.0	0.0	0.0

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:70.0 - 500.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP $\geq$ 20

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	134	1	2	2.2	0.3	134	0	2	1	8.3	0.8
AAL	3066	1	2	1.9	0.0	3070	0	2	0	8.3	1.7
AAR	1218	1	1	2.0	-0.3	1223	0	2	0	8.7	1.2
ACA	567	0	1	1.9	-0.4	574	0	1	0	7.6	0.6
ACI	44	0	0	1.5	0.7	45	0	2	0	6.5	1.6
ADV	23	0	0	2.5	1.2	22	0	0	0	9.1	2.4
AEA	118	4	2	2.2	-0.3	117	1	4	0	9.4	0.4
AEL	394	2	3	1.8	-0.5	394	0	3	0	8.4	1.6
AFL	110	3	100	4.2	2.5	109	2	100	1	15.6	1.0
AFR	852	1	6	1.9	0.0	855	0	6	0	8.1	1.2
AIC	23	35	30	5.2	2.8	23	0	17	0	14.1	-1.8
AJJ	51	6	6	2.5	-1.1	51	0	2	0	11.8	1.4
AMT	192	0	1	1.6	0.5	196	0	2	0	8.3	0.9
AMX	329	1	3	1.9	0.0	327	0	2	0	9.2	1.5
ANA	766	0	1	2.0	0.3	763	0	1	1	8.7	2.1
ANZ	3035	1	3	1.8	-0.1	3029	0	3	1	8.7	1.4
AOM	546	1	1	1.6	0.3	546	0	1	0	8.4	1.1
ARG	31	3	3	1.7	-0.7	31	0	0	0	8.3	0.7
ARP	290	1	4	2.3	0.3	279	0	7	3	9.2	1.2
ASY	30	13	17	2.5	1.5	29	0	3	0	7.7	1.5
ATN	97	1	5	2.3	-1.6	96	0	16	1	13.4	2.0
AUA	29	0	0	2.2	-0.9	32	0	3	0	11.3	0.0
AVA	370	1	3	2.0	-0.2	372	0	4	0	9.3	1.4
AVN	35	0	3	1.4	0.7	35	0	3	0	7.2	1.7
AZA	350	0	5	2.4	0.7	356	0	4	0	9.1	0.7
BAL	106	1	8	1.9	-0.1	107	0	8	0	7.1	1.3
BAW	778	0	3	2.1	-0.1	781	0	4	1	7.6	1.2
BBB	41	2	15	1.9	-1.0	40	0	15	0	8.8	1.5
BWA	469	1	3	1.9	0.5	468	0	3	0	9.6	2.0
CAL	1495	0	1	2.0	0.0	1492	0	3	0	9.6	1.3
CCA	285	1	94	2.9	0.1	287	0	6	0	10.7	0.7
CDN	2336	0	2	2.1	0.4	2335	0	3	0	8.5	1.3
CES	179	1	3	2.2	0.5	180	0	3	0	11.1	1.2
CFC	52	2	8	3.0	0.5	52	0	10	0	7.9	1.3
CFG	677	1	100	2.3	-1.4	678	0	3	0	8.2	0.9
CKS	79	1	100	2.8	0.3	80	5	100	0	14.9	3.8
CKT	28	0	4	2.2	0.8	28	0	4	0	8.8	2.8
CLX	47	4	9	2.6	-0.6	50	0	2	0	6.9	0.1
CMI	1148	1	3	2.2	0.2	1154	0	3	0	9.3	1.3
CMM	128	0	2	1.9	-0.4	130	0	2	0	9.1	1.1
COA	535	0	1	1.7	0.1	539	0	1	0	8.2	1.4
CPA	213	1	2	2.2	0.0	210	0	2	1	7.9	1.7
CRL	224	2	3	1.7	-0.5	226	0	3	1	9.0	1.4
CTM	41	2	100	2.6	-0.5	41	0	10	0	7.2	1.0
CUB	155	1	9	2.5	0.9	156	0	12	1	11.7	2.2
DAL	4026	1	2	2.2	0.4	3851	0	1	0	8.4	1.5
DHL	144	1	8	3.4	-2.0	142	1	100	0	12.0	0.6
DLH	2945	1	7	2.0	-0.3	2890	0	11	3	7.9	1.3
DOA	132	1	9	1.5	-0.5	134	1	10	0	7.1	1.7
EIA	70	3	6	2.0	0.4	71	0	4	0	7.5	-0.2
ELY	51	2	4	2.0	0.6	54	2	6	0	8.1	-0.2
EVA	1185	0	1	2.1	-0.5	1189	0	2	0	9.4	0.9
FDX	828	0	3	2.2	0.6	834	0	3	0	8.7	1.3
FIN	336	0	0	2.0	0.7	338	0	1	0	8.5	0.7
FJI	387	2	3	1.5	0.8	383	0	1	0	8.4	2.2
FKA	25	4	4	1.9	-0.3	25	0	8	4	10.0	2.1
FKE	22	0	5	3.0	0.0	22	0	9	5	8.8	0.8

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FMN	38	0	0	1.6	0.3	35	0	0	0	9.1	2.1
GAF	37	3	5	2.2	0.2	37	0	11	5	6.8	-0.8
GEC	25	0	0	3.5	2.1	25	0	0	0	8.2	3.6
GIA	229	3	3	1.3	0.0	220	0	3	2	7.1	1.5
HAL	1025	0	1	1.9	0.7	1030	0	2	1	8.9	0.6
HLF	152	1	100	2.1	-1.2	154	0	3	0	8.8	1.5
HZM	23	4	30	4.6	3.5	23	0	13	0	10.0	-1.1
IBE	1481	0	11	1.9	0.2	1477	0	12	0	8.9	1.0
ICE	376	1	1	1.8	0.3	369	0	1	0	7.2	0.7
JAA	55	9	13	2.4	0.1	56	2	4	0	11.4	1.7
JAL	4725	0	1	2.0	0.1	4723	0	2	0	9.0	1.2
JAS	98	2	1	1.8	0.1	97	0	1	0	7.9	-1.2
JAZ	80	0	84	1.9	0.9	81	0	1	0	8.7	-0.1
KAL	2757	1	1	2.1	-0.1	2756	0	2	0	9.2	1.2
KIW	27	4	11	3.6	3.2	26	0	4	0	9.8	0.1
KLM	1443	0	2	1.9	0.2	1445	0	2	1	8.0	1.3
LDA	253	2	100	2.1	-1.4	248	0	8	0	8.8	0.2
LDI	116	2	100	2.1	-1.5	114	0	3	0	7.9	1.9
LIB	157	1	1	1.8	-0.7	158	0	0	0	8.0	2.0
LOT	327	0	2	1.9	-0.2	326	1	2	0	8.3	1.2
LTU	660	1	1	1.7	0.2	647	0	3	1	9.1	1.9
LWD	191	0	1	1.4	-0.2	213	0	2	0	7.9	1.0
MAH	48	0	0	2.2	-1.4	54	0	0	0	9.2	1.8
MAS	270	1	3	2.3	-0.2	267	0	4	1	10.4	1.5
MDA	110	0	93	2.2	0.5	110	0	2	0	9.8	2.0
MPH	372	1	3	2.0	-0.3	370	0	3	1	9.1	1.3
NAL	98	1	100	2.3	0.7	98	0	3	1	10.4	0.7
NCA	669	0	0	2.0	0.2	666	0	1	1	8.0	0.5
NGA	81	0	0	1.6	0.5	81	0	4	0	10.9	1.1
NWA	9602	1	2	2.2	0.5	9624	0	2	1	8.9	1.2
PAL	914	1	2	2.4	-0.2	917	0	3	0	9.5	1.6
PAO	317	1	3	1.5	0.5	315	0	2	0	7.7	0.5
QFA	1671	1	2	1.6	0.0	1668	0	3	1	7.7	1.4
RAF	153	0	0	1.7	0.2	150	0	1	1	8.9	2.6
RKA	34	0	0	1.6	0.1	33	0	0	0	6.7	0.4
RON	64	3	8	2.1	0.6	63	0	10	5	8.6	1.1
RRR	139	1	16	2.7	-0.6	142	0	19	2	10.0	1.6
SAA	224	1	3	2.2	-1.2	224	0	3	1	8.7	0.8
SAS	1679	0	1	1.8	0.0	1673	0	3	2	7.6	0.7
SIA	1083	1	2	2.0	-0.3	1076	0	3	1	9.7	1.9
SJM	52	0	2	2.5	1.0	55	0	2	0	8.8	2.1
SOL	41	0	0	1.4	0.7	41	0	0	0	6.5	1.0
SPP	210	1	1	1.8	-0.2	204	0	2	0	8.7	1.3
SSR	21	0	5	2.4	1.9	20	0	0	0	6.3	0.6
SVA	101	0	4	2.0	0.4	104	0	4	0	9.2	2.5
SWR	205	2	3	1.7	0.5	194	0	3	0	8.8	1.3
TAP	543	1	2	2.0	-0.4	539	0	3	1	9.8	1.1
THA	278	0	0	1.7	-0.4	274	0	3	1	8.8	1.4
TOW	47	0	2	2.2	0.4	52	0	8	2	11.6	0.0
TWA	1093	1	1	2.0	0.2	1084	0	2	0	8.3	1.1
UAL	81467	1	3	1.6	0.1	81461	0	3	0	7.3	0.8
ULE	103	0	3	2.2	0.0	104	0	1	0	8.4	1.0
UPS	543	2	8	2.2	-0.5	548	0	8	0	9.4	1.3
VIA	423	0	4	1.8	0.2	422	0	4	0	8.6	1.1
VIR	38	0	0	1.8	0.1	38	0	3	3	6.4	1.8
VRG	35	0	3	1.4	-0.5	35	0	3	0	7.4	0.7
VSP	85	0	1	2.1	0.2	86	1	1	0	8.5	2.7

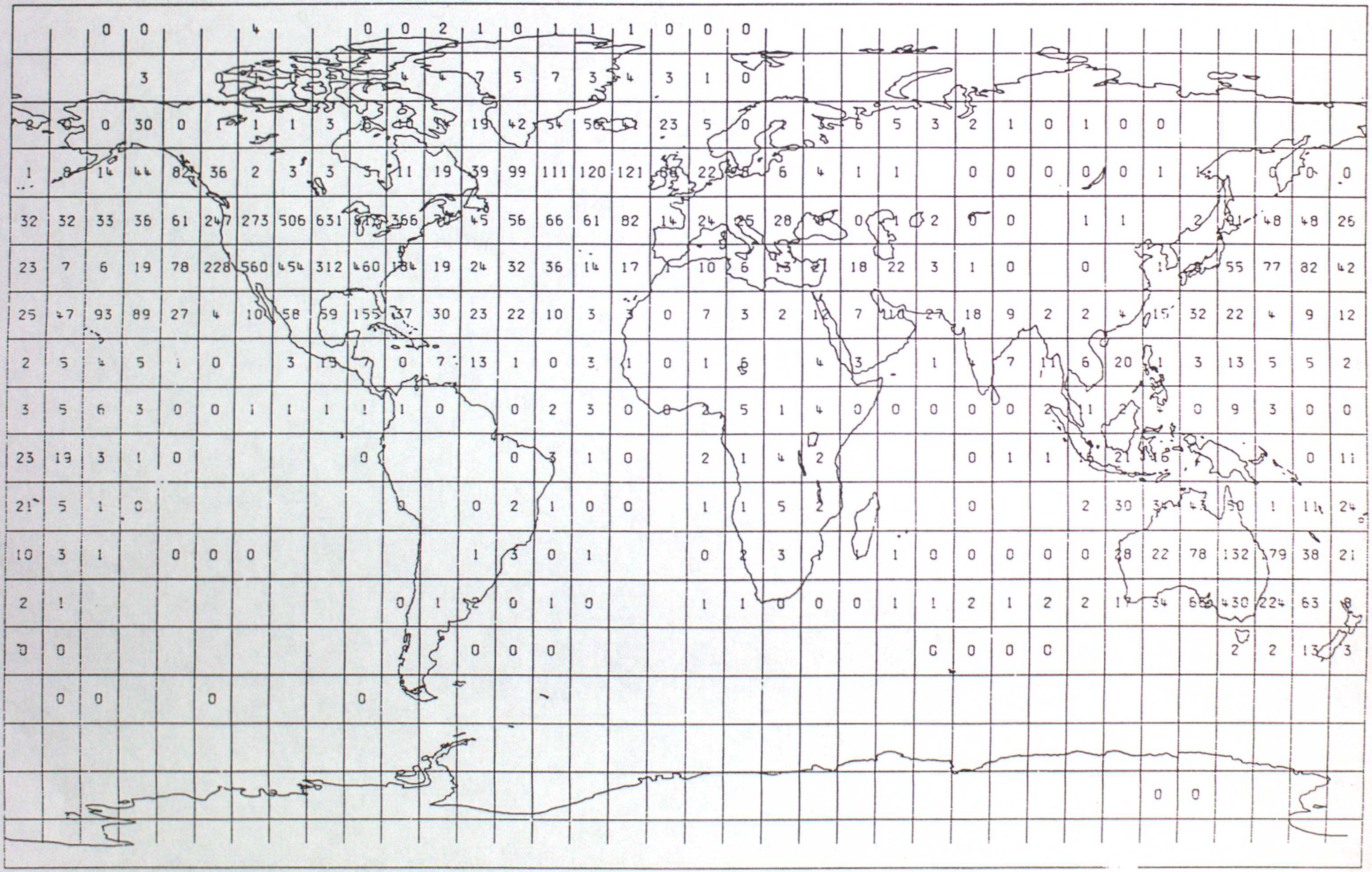
		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
WOA	20	0	5	1.3	0.3	20	0	10	0	9.8	1.7
AN	25801	0	2	1.7	0.4	25597	0	1	0	6.6	1.6
BA	19807	0	14	1.9	0.6	19753	0	14	0	7.6	1.5
DL	519	1	98	2.9	0.6	519	32	98	0	40.9	0.2
KL	5338	0	75	2.4	1.7	5329	0	6	0	7.0	1.2
LH	934	1	5	2.3	-0.1	925	1	7	2	10.5	2.2
NW	49246	0	4	1.7	0.2	49203	0	1	0	6.9	1.0
QF	14096	0	1	1.3	0.3	14068	0	1	0	6.6	1.1
M	261	3	6	3.2	1.8	269	0	8	0	11.6	1.1
N	296	1	3	2.6	0.1	316	0	5	0	10.4	1.5

MEAN DAILY COUNT OF AIRCRAFT 70 - 500 HPA

APRIL 1994

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

FIGURE 3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1 8 14 44 82 36 2 3 3 3 11 19 39 99 111 120 121 22 6 4 1 1 0 0 0 0 0 1 1 0 0 0
32 32 33 36 61 247 273 506 631 366 45 56 66 61 82 14 24 25 28 0 1 2 0 0 1 1 2 48 48 26
23 7 6 19 78 228 560 454 312 460 134 19 24 32 36 14 17 1 10 6 15 21 18 22 3 1 0 0 1 55 77 82 42
25 47 93 89 27 4 10 58 59 155 37 30 23 22 10 3 3 0 7 3 2 12 7 110 27 18 9 2 2 4 15 32 22 4 9 12
2 5 4 5 1 0 3 13 7 0 7 13 1 0 3 1 0 1 6 4 3 1 4 7 11 6 20 1 3 13 5 5 2
3 5 6 3 0 0 1 1 1 1 1 0 0 2 3 0 0 2 5 1 4 0 0 0 0 0 2 11 2 0 9 3 0 0
23 13 3 1 0 0 0 3 1 0 2 1 4 2 0 1 1 15 21 16 0 11
21 5 1 0 0 0 2 1 0 0 1 1 5 2 0 2 30 34 43 50 1 11 24
10 3 1 0 0 0 1 3 0 1 0 2 3 1 1 1 0 0 0 0 0 28 22 78 132 179 38 21
2 1 0 1 2 0 1 0 1 1 0 0 0 1 1 2 1 2 2 17 34 65 430 224 63 8
0 0 0 0 0 0 0 0 0 2 2 13 3
0 0 0 0
0 0

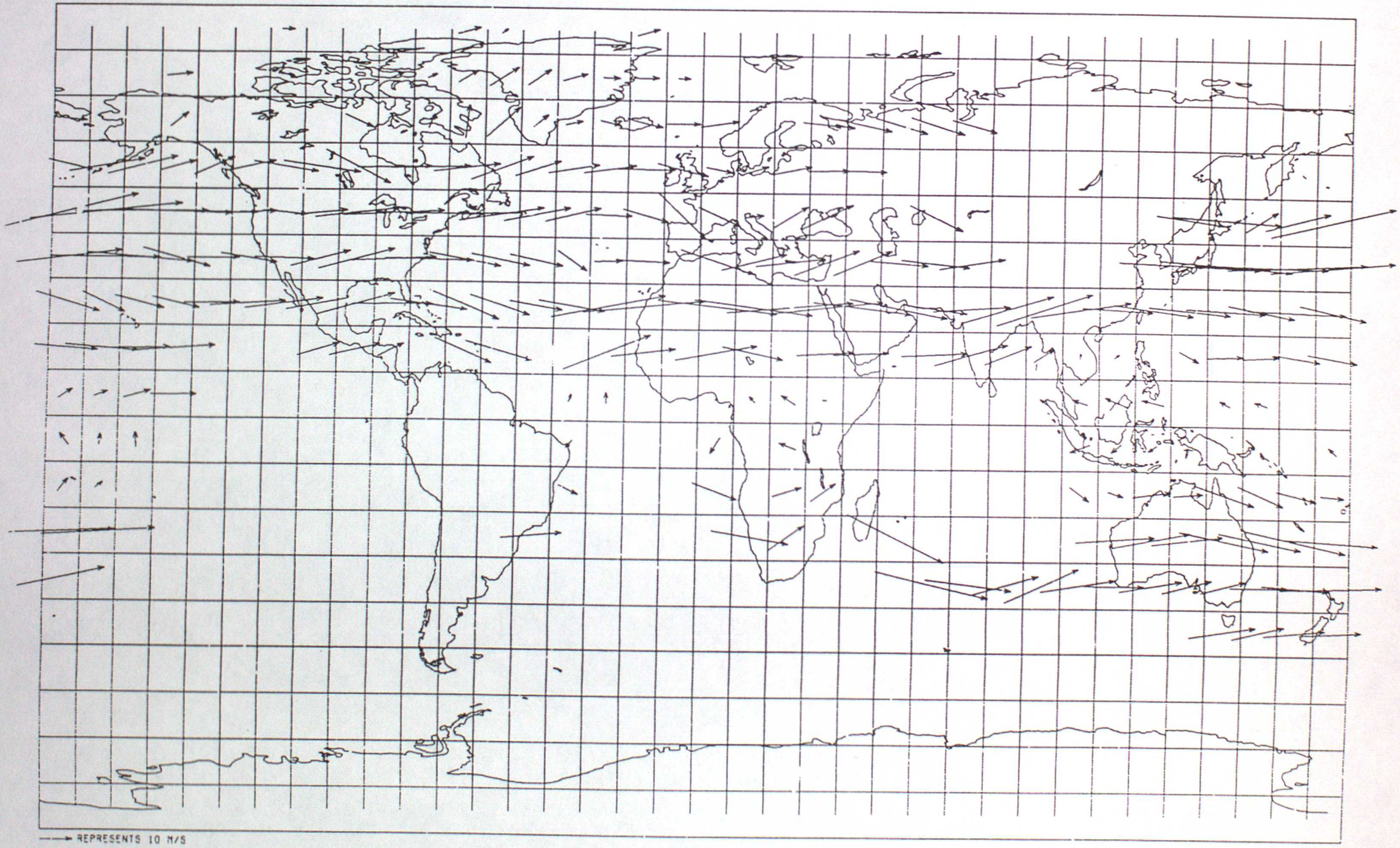
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

APRIL 1994

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



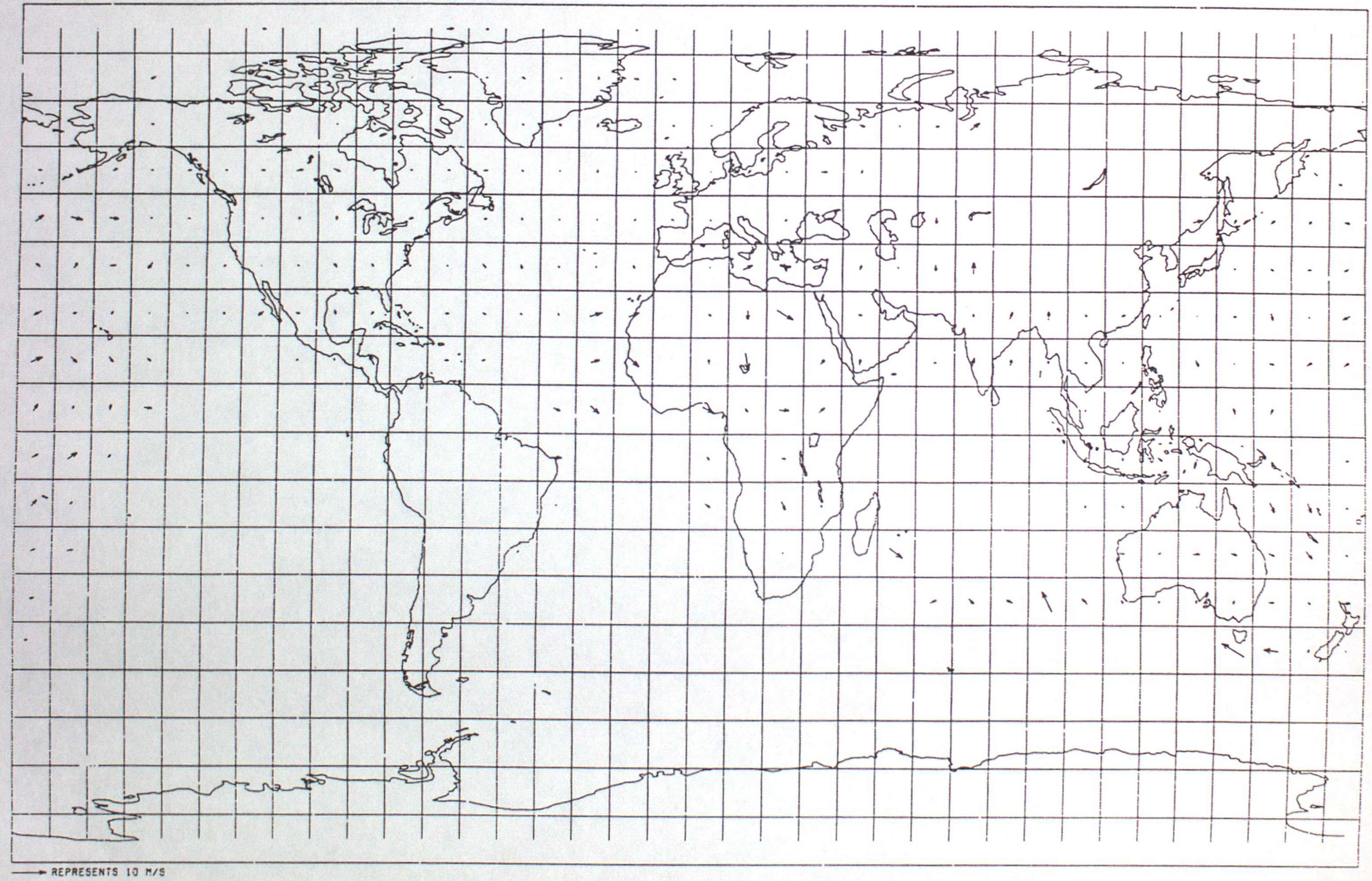
AIRCRAFT MEAN O-B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

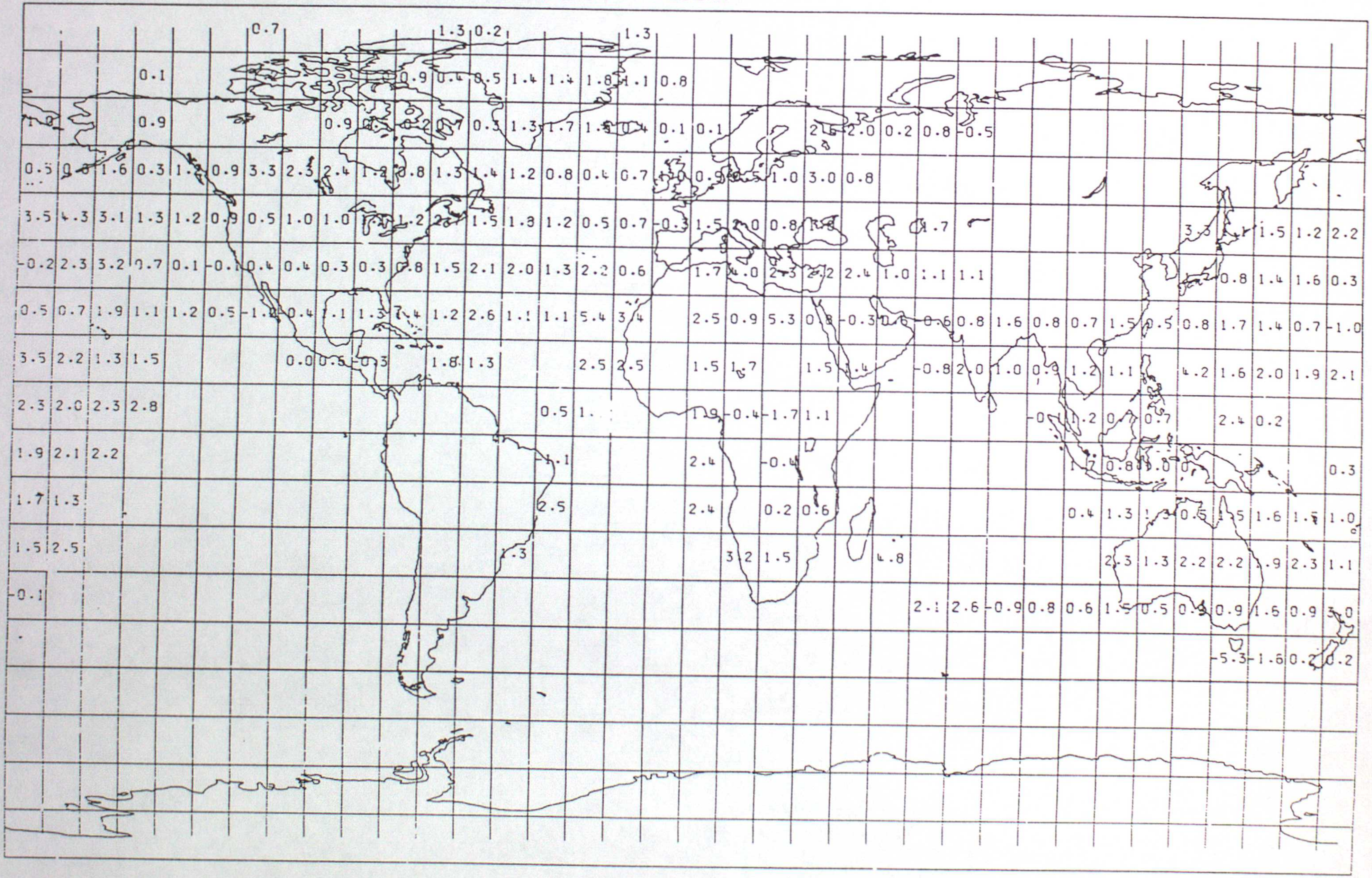
APRIL 1994

OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O-B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
APRIL 1994
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT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0.1 0.9 0.4 0.5 1.4 1.4 1.8 1.1 0.8
1.0 0.9 0.9 0.2 0.7 0.3 1.3 1.7 1.5 0.4 0.1 0.1 2.6 2.0 0.2 0.8 -0.5
0.5 0.8 1.6 0.3 1.2 0.9 3.3 2.3 2.4 1.2 0.8 1.3 1.4 1.2 0.8 0.4 0.7 1.0 0.9 0.5 1.0 3.0 0.8
3.5 4.3 3.1 1.3 1.2 0.9 0.5 1.0 1.0 1.2 1.5 1.3 1.2 0.5 0.7 -0.3 1.5 2.0 0.8 1.8 1.7 3.3 1.5 1.2 2.2
-0.2 2.3 3.2 0.7 0.1 -0.1 0.4 0.4 0.3 0.3 0.8 1.5 2.1 2.0 1.3 2.2 0.6 1.7 4.0 2.3 2.2 2.4 1.0 1.1 1.1 0.8 1.4 1.6 0.3
0.5 0.7 1.9 1.1 1.2 0.5 -1.0 0.4 1.1 1.3 7.4 1.2 2.6 1.1 1.1 5.4 3.4 2.5 0.9 5.3 0.8 -0.3 0.6 -0.6 0.8 1.6 0.8 0.7 1.5 0.5 0.8 1.7 1.4 0.7 -1.0
3.5 2.2 1.3 1.5 0.0 0.5 -0.3 1.8 1.3 2.5 2.5 1.5 1.7 1.5 1.4 -0.8 2.0 1.0 0.9 1.2 1.1 4.2 1.6 2.0 1.9 2.1
2.3 2.0 2.3 2.8 0.5 1.9 -0.4 -1.7 1.1 1.2 0.7 0.7 2.4 0.2
1.9 2.1 2.2 1.1 2.4 -0.4 1.7 0.8 0.0 0.3
1.7 1.3 2.5 2.4 0.2 0.6 0.4 1.3 0.5 1.5 1.6 1.0
1.5 2.5 1.3 3.2 1.5 4.8 2.3 1.3 2.2 2.2 2.3 1.1
-0.1 2.1 2.6 -0.9 0.8 0.6 1.5 0.5 0.9 1.6 0.9
-5.3 -1.6 0.2 0.2

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
APRIL 1994
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

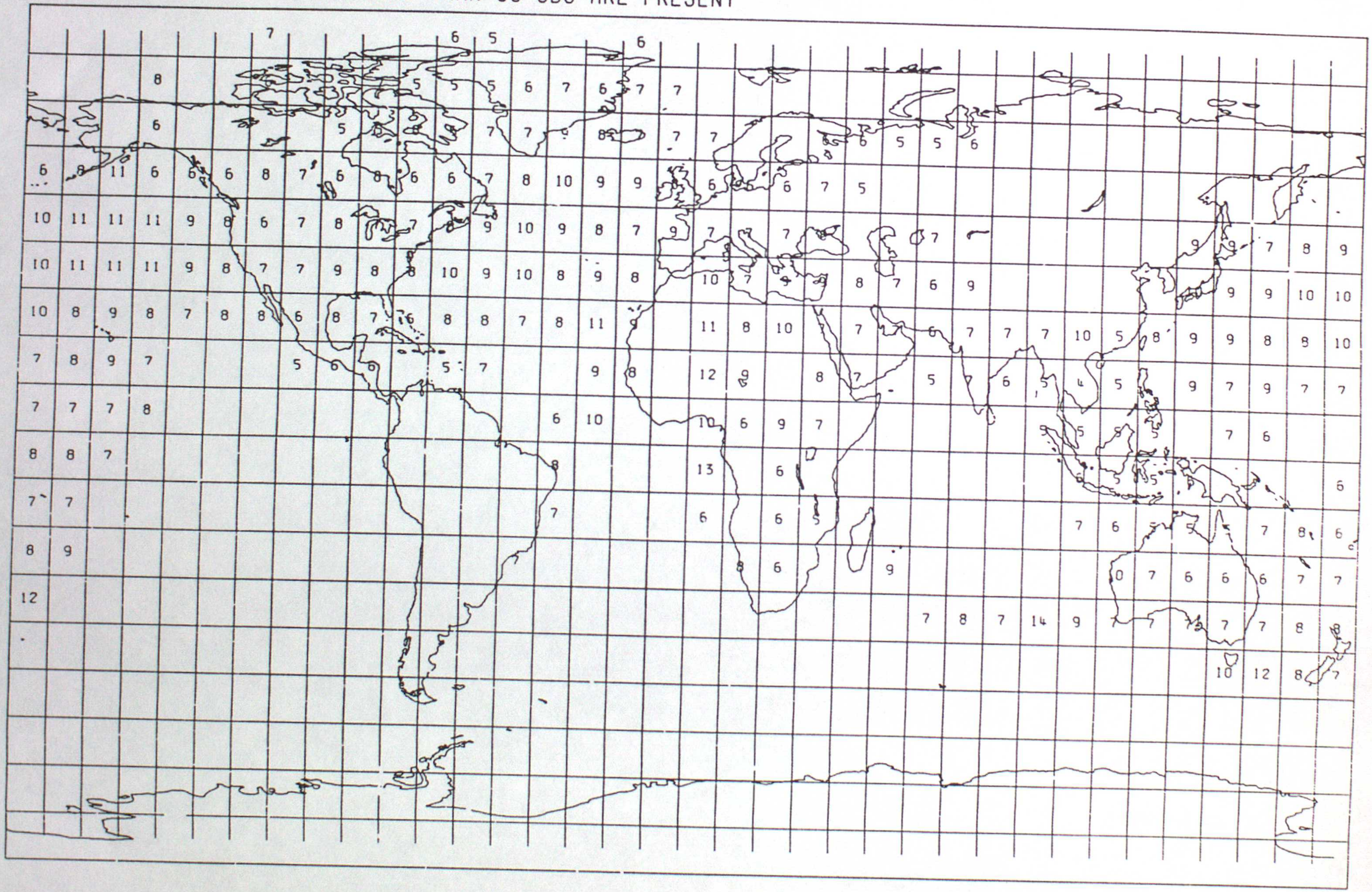


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA :≥ 3 levels with ≥ 10 observations and ≥ 100 m weighted RMS.

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
17220	12	Z	30	38/ 27	19	1	64.5	237.1	245.7	6
23418	12	Z	200	65/ 57	28	0	50.2	112.3	123.0	8
42101	00	Z	70	30/ 76	13	0	154.0	58.3	164.7	6
42101	12	Z	150	30/ 76	16	0	141.9	29.4	144.9	6
42182	00	Z	50	29/ 77	21	1	164.0	66.1	176.9	7
42182	12	Z	30	29/ 77	12	1	115.5	231.4	258.6	7
42339	00	Z	100	26/ 73	11	0	157.5	37.7	161.9	7
42339	12	Z	250	26/ 73	22	0	83.6	31.5	89.3	6
42361	00	Z	50	26/ 78	17	2	182.9	112.9	215.0	8
42361	12	Z	50	26/ 78	11	0	191.2	98.1	214.9	10
42369	00	Z	150	27/ 81	14	1	89.6	141.1	167.2	6
42369	12	Z	200	27/ 81	18	4	97.1	111.8	148.1	7
42379	00	Z	30	27/ 83	7	6	280.9	173.4	330.1	11
42379	12	Z	200	27/ 83	16	0	124.3	64.5	140.0	10
42397	12	Z	300	27/ 88	18	0	49.5	-69.3	85.2	5
42410	00	Z	30	26/ 92	21	1	123.6	175.5	214.7	7
42410	12	Z	50	26/ 92	13	0	175.5	94.1	199.1	8
42492	00	Z	70	26/ 85	10	0	197.9	57.8	206.2	6
42492	12	Z	150	26/ 85	11	0	109.0	-0.1	109.0	4
42647	12	Z	150	23/ 73	16	0	89.2	50.5	102.5	4
42667	00	Z	150	23/ 77	13	0	97.1	-30.5	101.8	4
42724	00	Z	70	24/ 91	14	0	151.4	126.9	197.6	9
42724	12	Z	250	24/ 91	12	0	84.0	-11.4	84.8	4
42809	00	Z	50	23/ 88	23	1	134.0	117.0	177.9	6
42809	12	Z	70	23/ 88	19	0	143.2	-24.5	145.2	6
42867	00	Z	30	21/ 79	11	0	114.4	238.5	264.5	6
42867	12	Z	50	21/ 79	12	0	120.3	221.7	252.2	6
42875	00	Z	70	21/ 82	14	0	169.0	50.9	176.5	6
42875	12	Z	70	21/ 82	16	2	172.8	16.1	173.6	8
42971	00	Z	100	20/ 86	20	3	152.8	34.2	156.6	8
42971	12	Z	70	20/ 86	9	1	166.2	57.2	175.7	7
43003	00	Z	70	19/ 73	10	5	142.9	-213.4	256.8	8
43003	12	Z	50	19/ 73	10	0	160.2	-33.2	163.6	4
43014	00	Z	100	20/ 75	11	1	141.8	27.0	144.3	5
43014	12	Z	100	20/ 75	11	2	171.3	110.1	203.6	7
43128	00	Z	150	17/ 78	22	0	107.0	-20.7	109.0	6
43128	12	Z	70	17/ 78	19	2	133.7	166.5	213.6	7
43150	00	Z	200	18/ 83	25	0	76.4	69.6	103.4	5
43185	00	Z	100	16/ 81	9	3	108.9	144.3	180.8	8
43185	12	Z	70	16/ 81	10	0	178.1	149.2	232.3	8
43192	00	Z	50	15/ 74	14	0	162.2	67.6	175.8	6
43192	12	Z	100	15/ 74	11	1	88.0	107.2	138.6	4
43279	00	Z	50	13/ 80	15	0	181.0	44.5	186.4	6
43279	12	Z	50	13/ 80	19	3	148.7	159.9	218.3	10
43285	00	Z	50	13/ 75	12	1	213.0	58.0	220.7	8
43285	12	Z	70	13/ 75	21	1	177.8	93.1	200.7	9
43295	00	Z	70	13/ 78	10	0	126.1	188.2	226.6	5
43295	12	Z	100	13/ 78	12	2	69.3	156.7	171.3	5
43346	00	Z	100	11/ 80	19	1	122.7	-118.8	170.8	8
43346	12	Z	70	11/ 80	22	0	152.9	85.3	175.1	6
43353	12	Z	150	10/ 76	13	0	132.3	-15.8	133.2	5
43369	00	Z	150	8/ 73	21	2	115.7	-95.7	150.1	9
43369	12	Z	70	8/ 73	17	2	153.5	40.2	158.7	7
43371	00	Z	50	8/ 77	17	0	187.0	-106.6	215.2	7
43371	12	Z	50	8/ 77	19	3	190.9	108.2	219.5	9
44277	00	Z	200	46/ 96	14	0	49.5	65.7	82.2	4
44277	12	Z	200	46/ 96	14	0	28.8	83.5	88.3	4

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
44288	00	Z	200	46/ 103	7	5	71.4	147.7	164.0	4
44373	12	Z	200	44/ 104	11	3	30.1	175.8	178.4	6
48407	12	Z	30	15/ 105	11	0	84.3	190.6	208.4	4
48820	00	Z	700	21/ 106	27	0	14.0	-44.9	47.0	4
53513	12	Z	70	41/ 107	25	0	49.5	119.0	128.8	4
54135	12	Z	200	44/ 122	25	1	48.3	76.3	90.3	4
56739	00	Z	100	25/ 98	28	0	45.1	122.6	130.7	4
56739	12	Z	100	25/ 98	28	0	49.2	136.0	144.6	5
56964	12	Z	70	23/ 101	27	0	39.7	144.6	150.0	4
56985	12	Z	100	23/ 103	27	0	31.1	119.3	123.2	4
57679	00	Z	100	28/ 113	27	0	59.1	114.0	128.4	7
57679	12	Z	70	28/ 113	14	0	34.5	145.4	149.5	4
57993	00	Z	100	26/ 115	28	0	39.2	124.8	130.8	6
57993	12	Z	100	26/ 115	28	0	31.1	117.1	121.2	5
58424	00	Z	200	31/ 117	28	0	22.8	87.7	90.6	8
58424	12	Z	100	31/ 117	27	0	31.3	115.0	119.2	6
58665	00	Z	100	29/ 121	26	0	27.9	113.2	116.5	5
60360	12	Z	200	37/ 8	10	3	52.8	167.4	175.5	8
62306	12	Z	100	31/ 27	11	5	41.1	261.2	264.4	7
62378	12	Z	70	30/ 31	11	1	50.8	228.5	234.0	6
70219	00	Z	30	61/-162	23	0	33.0	248.4	250.6	4
82332	12	Z	30	-3/ -60	11	0	67.5	176.5	189.0	4
89009	00	Z	300	-90/ 0	14	0	63.9	53.9	83.6	4
89512	12	Z	150	-71/ 12	12	0	40.7	83.0	92.4	6
91557	12	Z	500	-18/ 168	26	0	15.3	-116.3	117.3	9
97014	00	Z	150	2/ 125	22	0	69.8	-127.1	145.0	9

AVAILABILITY - TEMP - 500 HPA GEOPOTENTIAL - APRIL 1994

FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1464

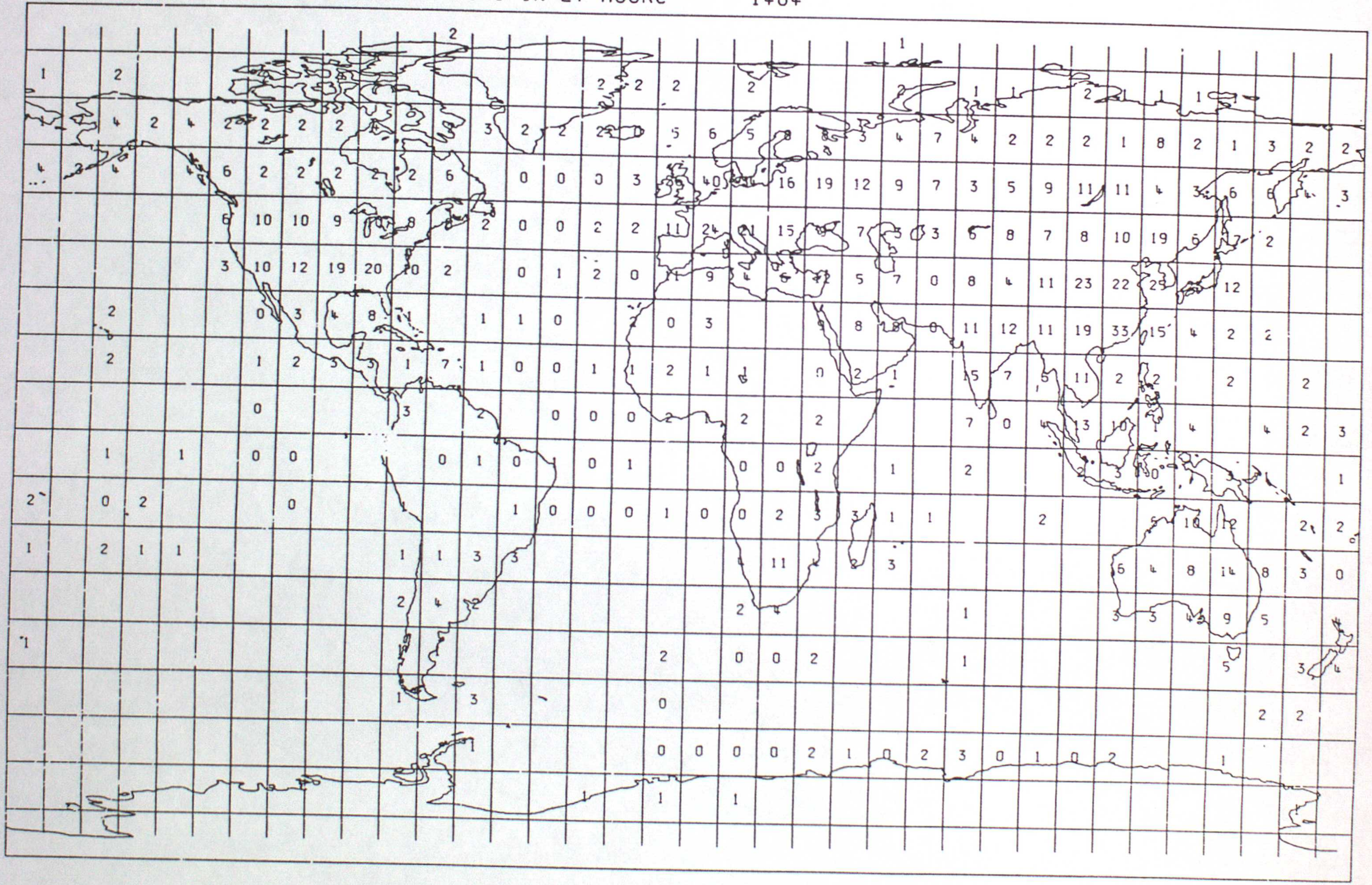


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored		
	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	:$\geq$ 10 observations and $\geq$ 15 $m\ s^{-1}$ RMS vector wind.	

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
15480	00	V	250	44/ 29	10	0	10	-2.2	-9.0	15.0	1
42339	00	V	150	26/ 73	10	0	10	-16.4	5.2	17.5	2
42339	12	V	200	26/ 73	14	0	0	-8.9	3.3	15.6	1
42369	00	V	200	27/ 81	19	0	0	-13.4	-4.0	18.2	2
42369	12	V	100	27/ 81	9	1	20	13.0	-2.4	17.0	2
42379	00	V	100	27/ 83	13	1	28	21.2	6.8	27.3	2
42379	12	V	100	27/ 83	14	0	7	12.9	3.5	21.0	1
42397	00	V	200	27/ 88	15	0	6	-11.0	-0.6	19.9	1
42397	12	V	200	27/ 88	12	0	0	-11.6	-0.5	15.5	1
42410	00	V	300	26/ 92	20	0	10	-0.3	4.1	17.5	2
43014	12	V	200	20/ 75	15	0	26	9.5	9.5	21.4	2
60571	12	V	250	32/ -2	26	0	7	-10.2	-1.1	18.5	3
82599	12	V	100	-6/ -35	11	1	75	5.5	-3.5	24.7	5
87418	12	V	250	-33/ -69	28	0	100	-2.2	-2.0	15.3	1

AVAILABILITY - TEMP/PILOT - 300 HPA WIND - APRIL 1994

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

TOTAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS - 1321

FIGURE 9

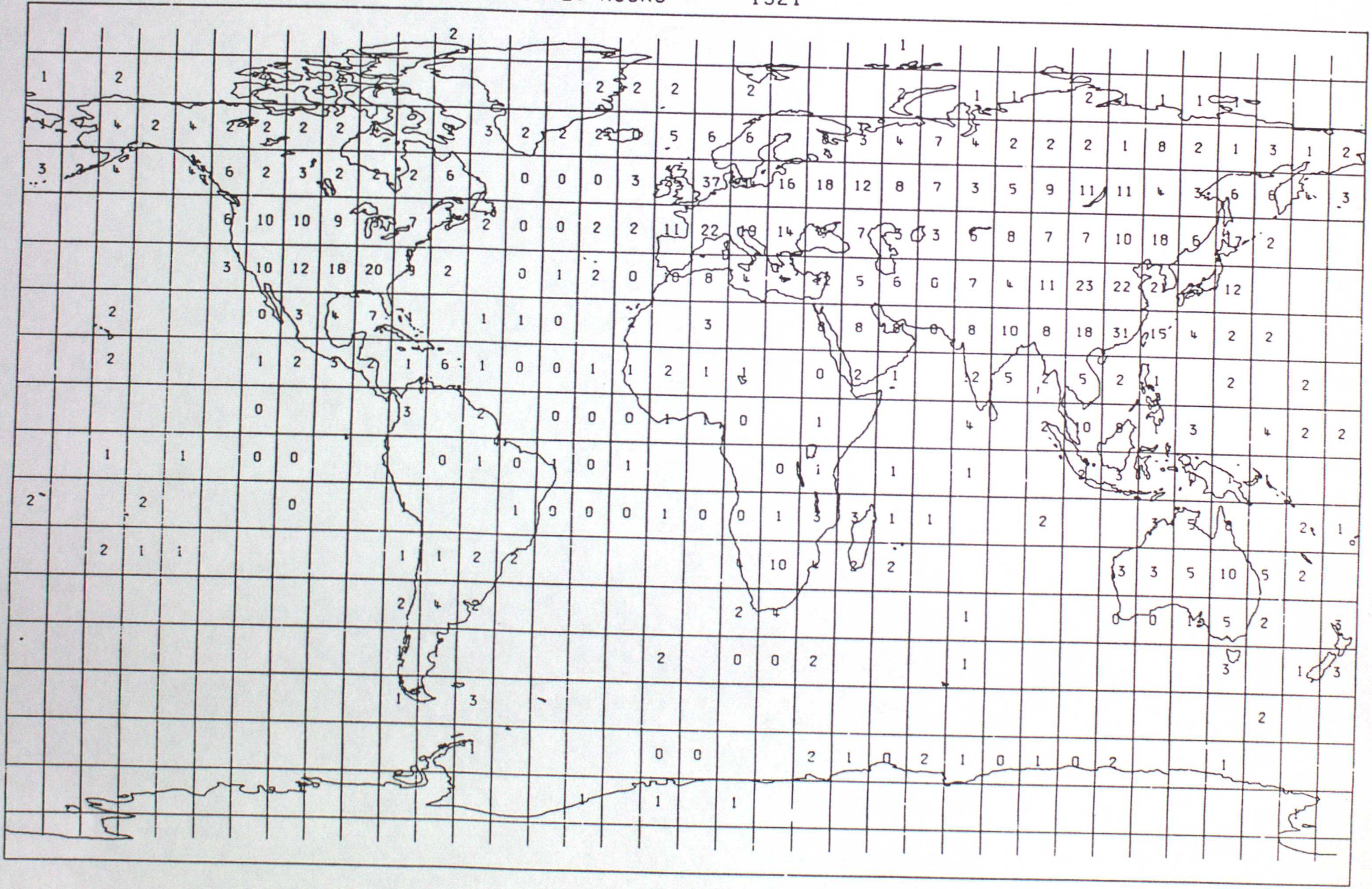


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5, and ABSOLUTE BIAS ≥ 10°, with SD < 30°, and MAX SPREAD < 10°	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17280	00	DD	38/ 40	27	-10.1	5.7	15.0
24641	00	DD	64/ 122	25	12.4	5.5	13.2
24641	12	DD	64/ 122	23	15.1	3.8	10.8
33317	00	DD	50/ 27	19	-11.1	5.6	13.6
42410	12	DD	26/ 92	14	-10.5	4.7	13.7
42867	00	DD	21/ 79	20	-12.9	3.0	9.5
42867	12	DD	21/ 79	19	-11.8	5.3	10.2
43279	00	DD	13/ 80	15	-11.4	4.7	21.1
43279	12	DD	13/ 80	15	-12.9	3.1	24.5
43295	12	DD	13/ 78	8	-11.3	7.1	28.8
54857	00	DD	36/ 120	26	18.7	4.6	12.3
54857	12	DD	36/ 120	27	16.5	3.3	12.5
58457	00	DD	30/ 120	28	-22.5	5.5	10.7
58457	12	DD	30/ 120	28	-20.7	3.6	9.9
60630	12	DD	27/ 2	19	15.8	3.5	15.7
67083	00	DD	-19/ 47	24	10.9	4.1	13.0
83746	12	DD	-23/ -43	15	-10.4	8.9	18.8

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH:April, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer:701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

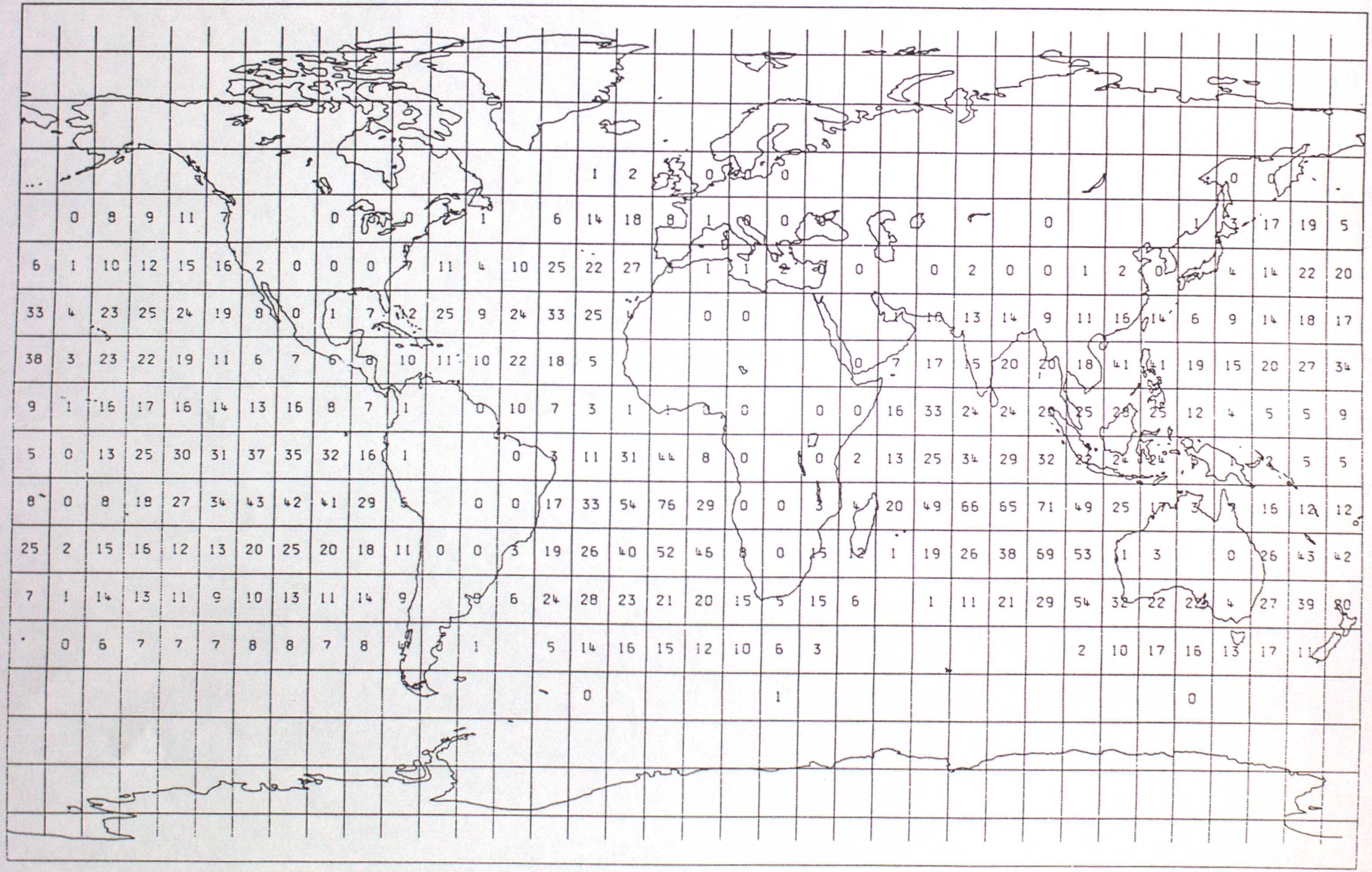
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

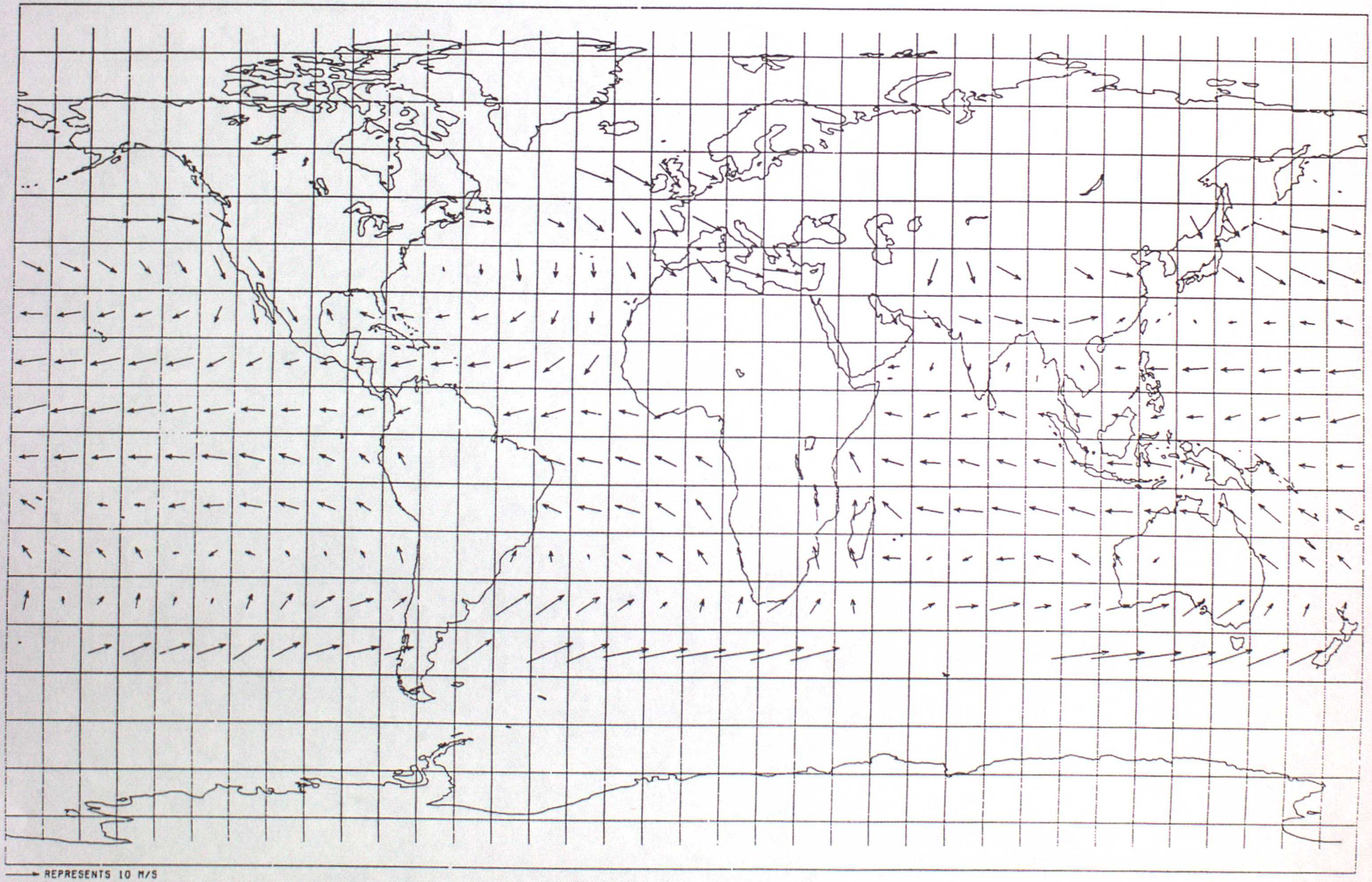
:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
APRIL 1994


1 2 0 0 0 0
0 8 9 11 7 0 0 1 6 14 18 8 1 0 0 0 1 3 17 19 5
6 1 10 12 15 16 2 0 0 0 7 11 4 10 25 22 27 3 1 1 2 0 0 0 2 0 0 1 2 0 4 14 22 20
33 4 23 25 24 19 8 0 1 7 12 25 9 24 33 25 4 0 0 10 13 14 9 11 16 14 6 9 14 18 17
38 3 23 22 19 11 6 7 6 8 10 11 10 22 18 5 0 7 17 15 20 20 18 41 41 19 15 20 27 34
9 1 16 17 16 14 13 16 8 7 1 0 10 7 3 1 1 0 0 0 0 16 33 24 24 20 25 29 25 12 4 5 5 9
5 0 13 25 30 31 37 35 32 16 1 0 3 11 31 44 8 0 0 2 13 25 34 29 32 2 24 24 5 1 2 5 5
8 0 8 18 27 34 43 42 41 29 5 0 0 17 33 54 76 29 0 0 3 4 20 49 66 65 71 49 25 17 3 7 16 12 12
25 2 15 16 12 13 20 25 20 18 11 0 0 3 19 26 40 52 46 8 0 15 12 1 19 26 38 69 53 1 3 0 26 43 42
7 1 14 13 11 9 10 13 11 14 9 9 6 24 28 23 21 20 15 5 15 6 1 11 21 29 54 32 22 22 4 27 39 30
0 6 7 7 7 8 8 7 8 4 0 1 5 14 16 15 12 10 6 3 2 10 17 16 13 17 11
0 1 0

SATOB VECTOR MEAN WINDS BETWEEN 701-1000 HPA
APRIL 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11


REPRESENTS 10 M/S

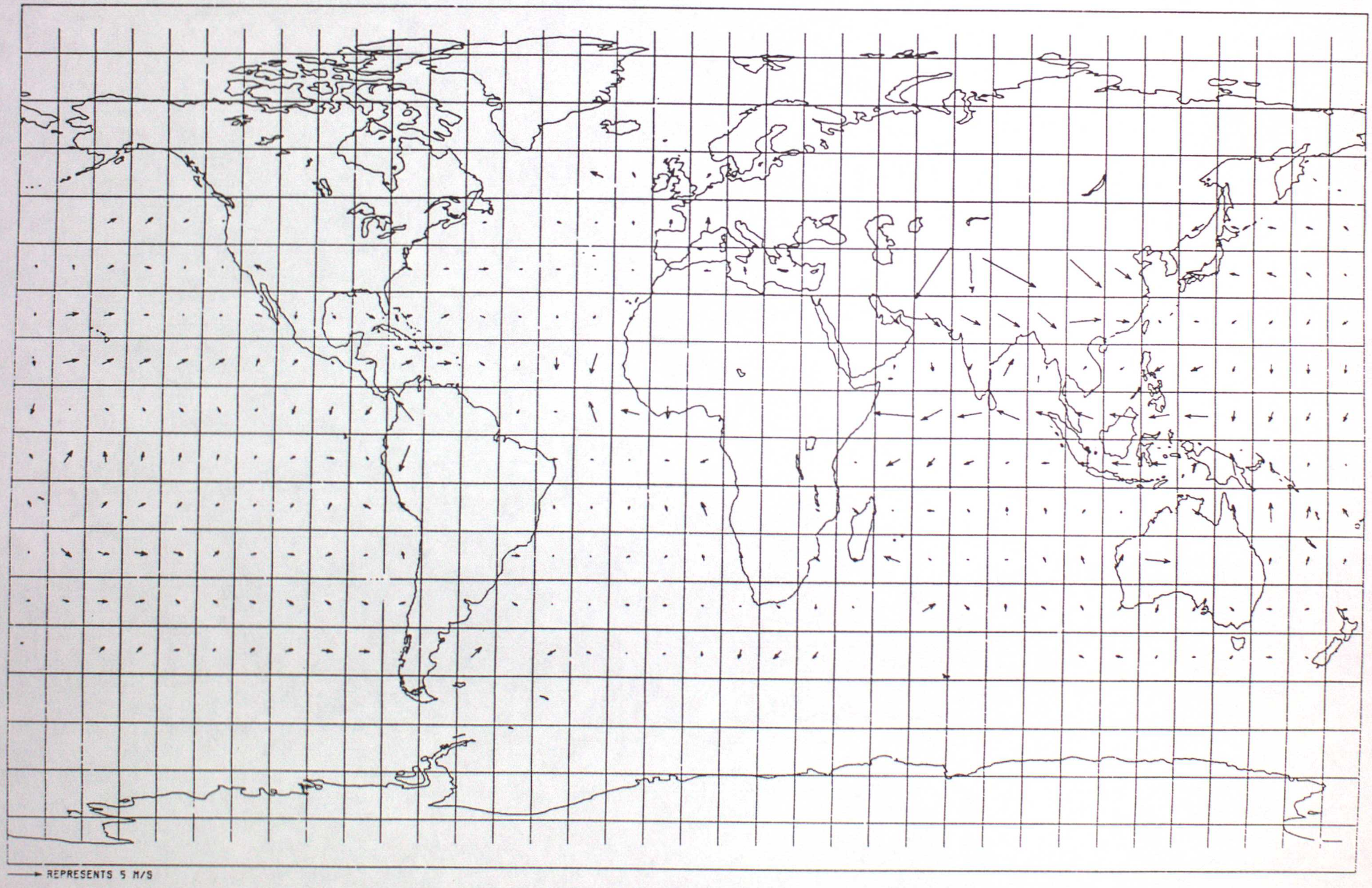
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701-1000 HPA

APRIL 1994

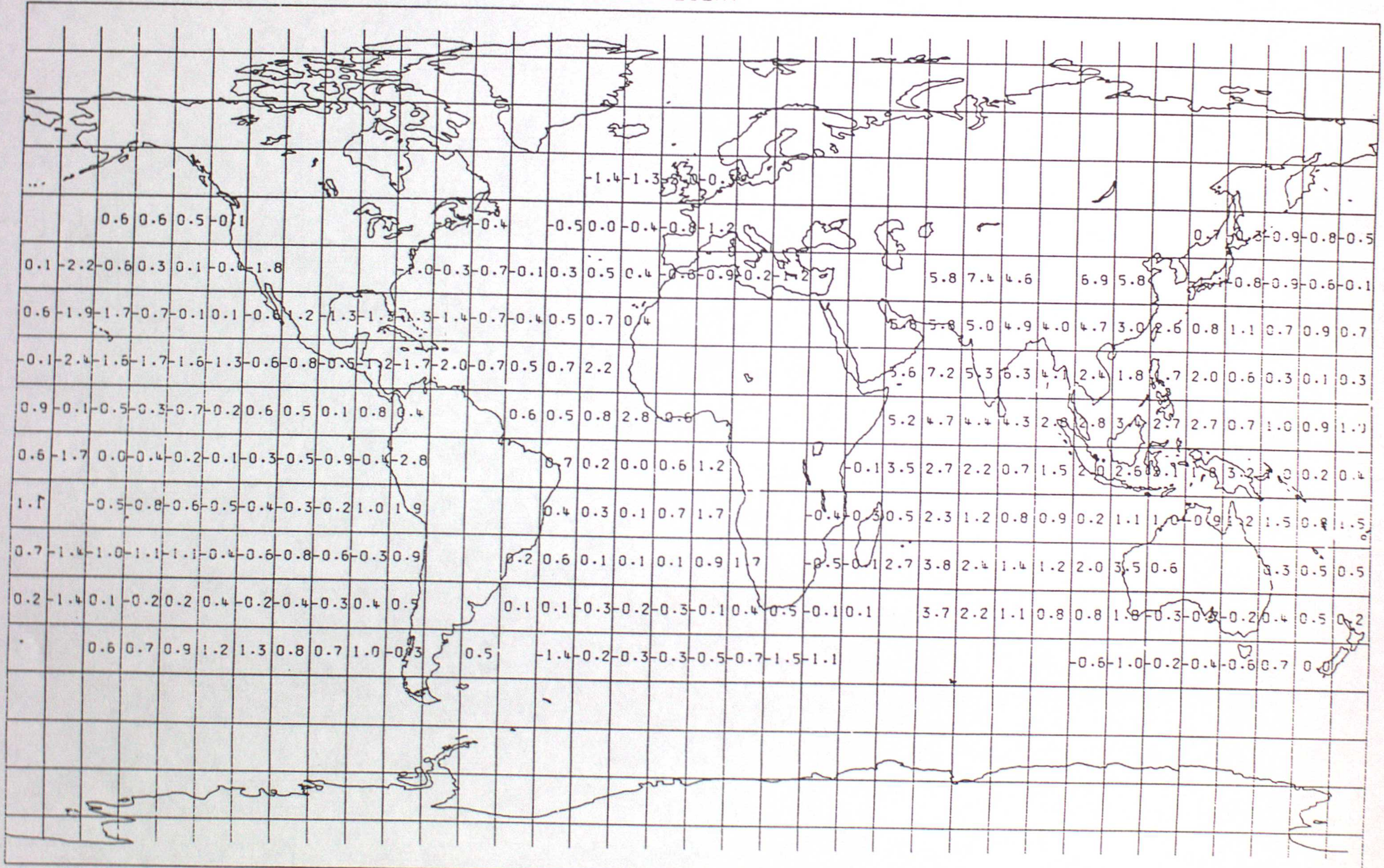
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

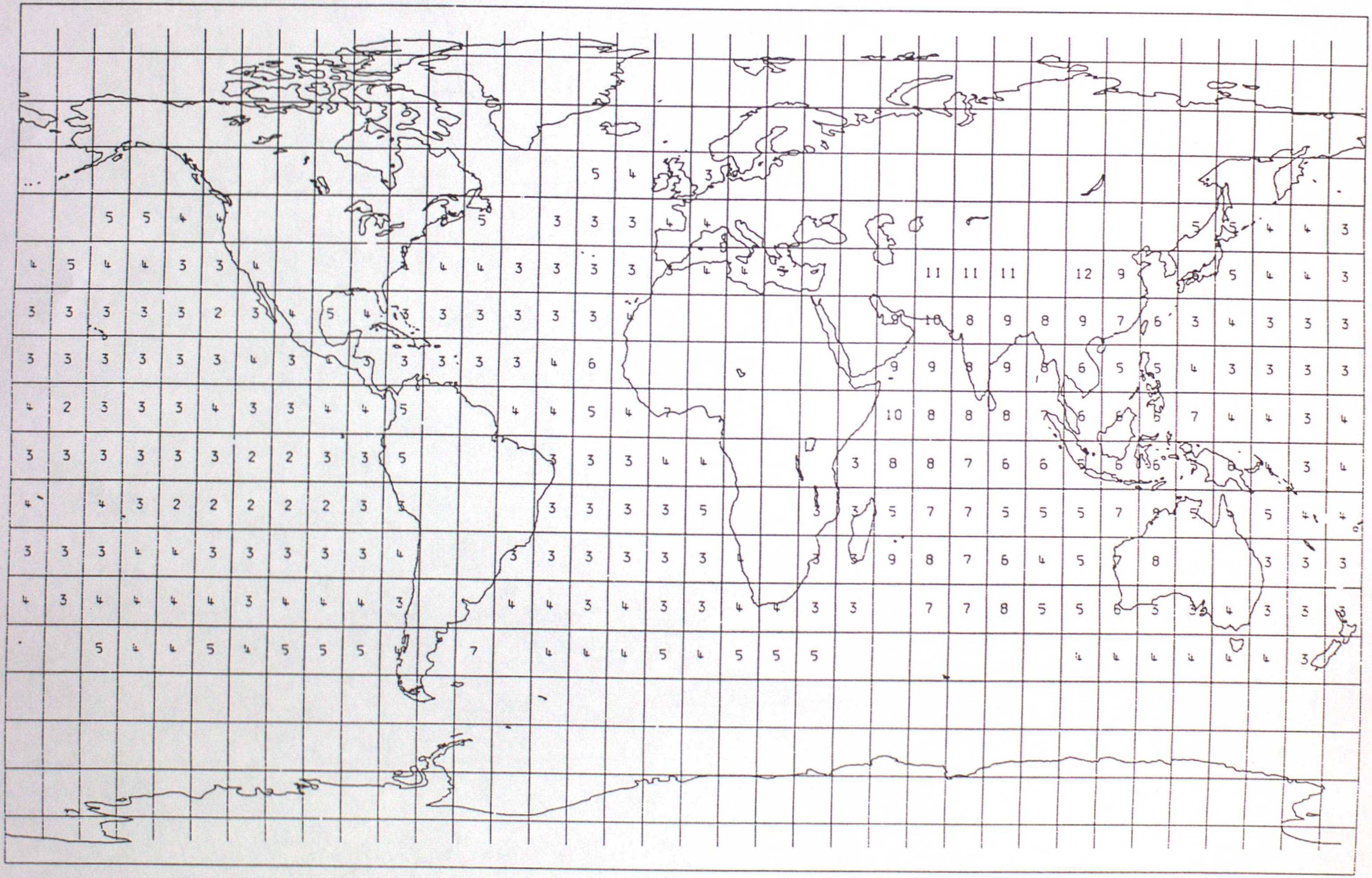
FIGURE 12



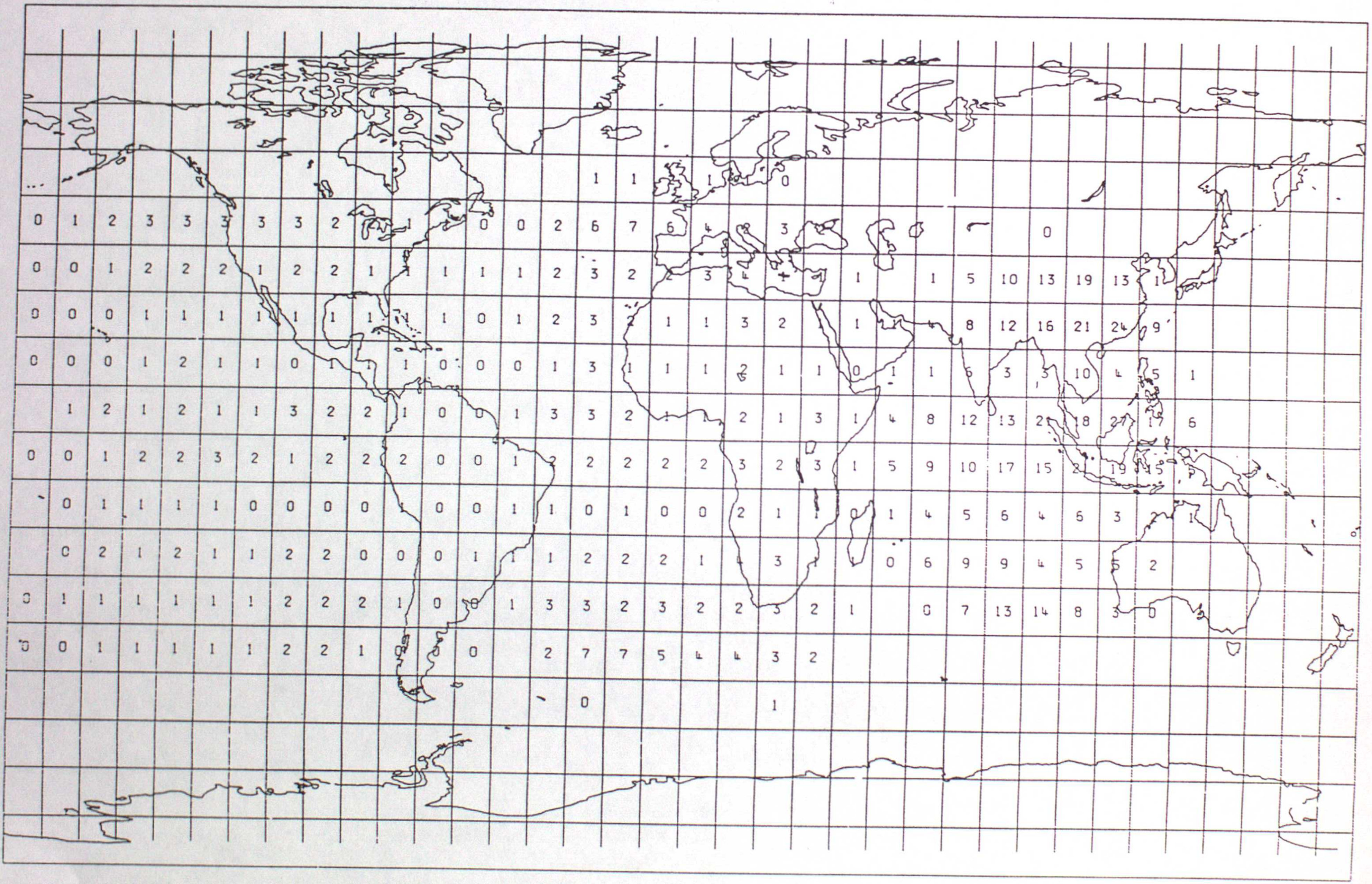
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
APRIL 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-1.4 -1.3 -0.3
0.6 0.6 0.5 -0.1 -0.4 -0.5 0.0 -0.4 -0.8 -1.2 0.7 -0.3 -0.9 -0.8 -0.5
0.1 -2.2 -0.6 0.3 0.1 -0.4 -1.8 -1.0 -0.3 -0.7 -0.1 0.3 0.5 0.4 -0.6 -0.9 0.2 -1.2 5.8 7.4 4.6 6.9 5.8 -0.8 -0.9 -0.6 -0.1
0.6 -1.9 -1.7 -0.7 -0.1 0.1 -0.6 1.2 -1.3 -1.3 -1.3 -1.4 -0.7 -0.4 0.5 0.7 0.4 5.8 5.8 5.0 4.9 4.0 4.7 3.0 2.6 0.8 1.1 0.7 0.9 0.7
-0.1 -2.4 -1.5 -1.7 -1.6 -1.3 -0.6 -0.8 -0.5 -1.2 -1.7 -2.0 -0.7 0.5 0.7 2.2 5.6 7.2 5.3 6.3 4.1 2.4 1.8 1.7 2.0 0.6 0.3 0.1 0.3
0.9 -0.1 -0.5 -0.3 -0.7 -0.2 0.6 0.5 0.1 0.8 0.4 0.6 0.5 0.8 2.8 0.6 5.2 4.7 4.4 4.3 2.8 2.8 3.4 2.7 2.7 0.7 1.0 0.9 1.0
0.6 -1.7 0.0 -0.4 -0.2 -0.1 -0.3 -0.5 -0.9 -0.4 -2.8 0.7 0.2 0.0 0.6 1.2 -0.1 3.5 2.7 2.2 0.7 1.5 2.0 2.6 3.1 1.8 3.2 0.0 0.2 0.4
1.1 -0.5 -0.8 -0.6 -0.5 -0.4 -0.3 -0.2 1.0 1.9 0.4 0.3 0.1 0.7 1.7 -0.4 -0.3 0.5 2.3 1.2 0.8 0.9 0.2 1.1 1.0 -0.9 1.2 1.5 0.8 1.5
0.7 -1.4 -1.0 -1.1 -1.1 -0.4 -0.6 -0.8 -0.6 -0.3 0.9 0.2 0.6 0.1 0.1 0.1 0.9 1.7 -0.5 -0.1 2.7 3.8 2.4 1.4 1.2 2.0 3.5 0.6 0.3 0.5 0.5
0.2 -1.4 0.1 -0.2 0.2 0.4 -0.2 -0.4 -0.3 0.4 0.5 0.1 0.1 -0.3 -0.2 -0.3 -0.1 0.4 -0.5 -0.1 0.1 3.7 2.2 1.1 0.8 0.8 1.8 -0.3 -0.3 -0.2 0.4 0.5 0.2
0.6 0.7 0.9 1.2 1.3 0.8 0.7 1.0 -0.3 0.5 -1.4 -0.2 -0.3 -0.3 -0.5 -0.7 -1.5 -1.1 -0.6 -1.0 -0.2 -0.4 -0.6 0.7 0.0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
APRIL 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

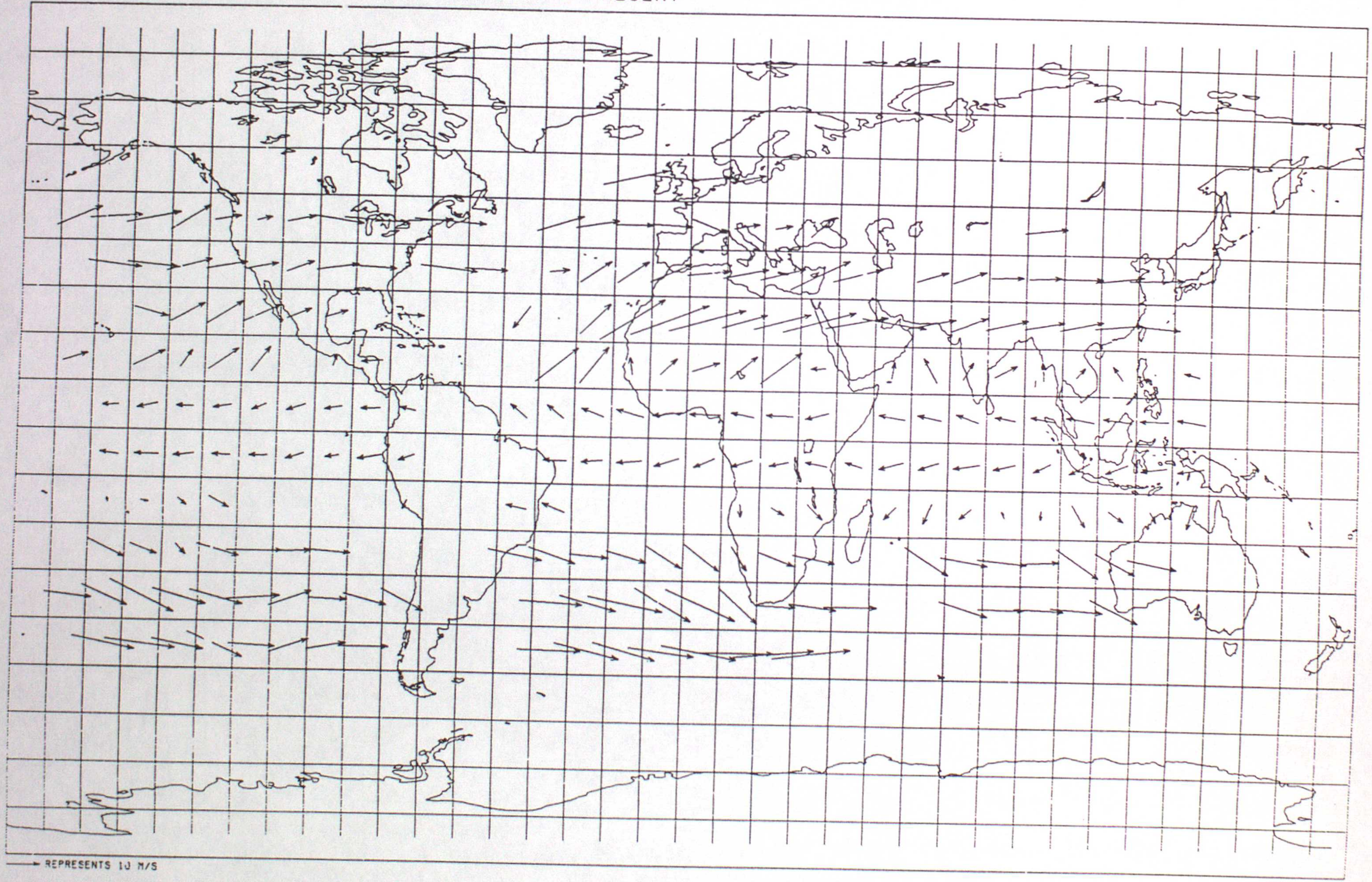


AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
APRIL 1994


1 1 1 1 0
0 1 2 3 3 3 3 3 2 1 0 0 2 6 7 6 4 8 3 0
0 0 1 2 2 2 1 2 2 1 1 1 1 1 2 3 2 2 3 4 1 1 5 10 13 19 13 1
0 0 0 1 1 1 1 1 1 1 1 1 0 1 2 3 2 1 1 3 2 1 1 1 4 8 12 16 21 24 9
0 0 0 1 2 1 1 0 1 1 1 0 0 0 1 3 1 1 1 2 1 1 0 1 1 6 3 3 10 4 5 1
1 2 1 2 1 1 3 2 2 1 0 0 1 3 3 2 1 1 2 1 3 1 4 8 12 13 21 18 27 17 6
0 0 1 2 2 3 2 1 2 2 2 0 0 1 2 2 2 2 2 3 2 3 1 5 9 10 17 15 21 19 15
0 1 1 1 1 0 0 0 0 1 0 0 1 1 0 1 0 0 2 1 1 0 1 4 5 6 4 6 3 2 1
0 2 1 2 1 1 2 2 0 0 0 1 1 1 2 2 2 1 4 3 1 1 0 6 9 9 4 5 5 2
0 1 1 1 1 1 1 2 2 2 1 0 8 1 3 3 2 3 2 2 3 2 1 0 7 13 14 8 3 0
0 0 1 1 1 1 1 2 2 1 0 0 0 2 7 7 5 4 4 3 2
0 1

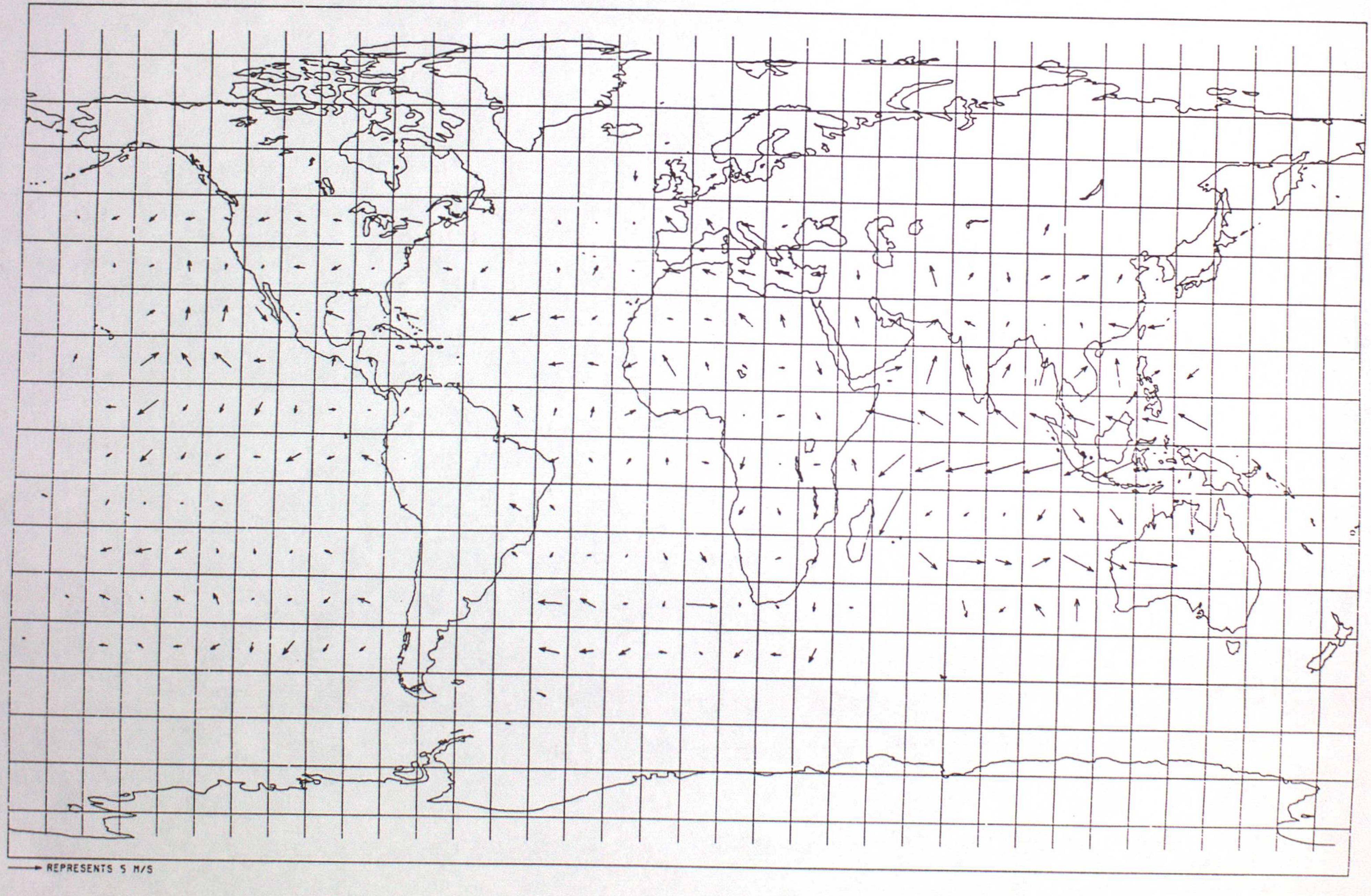
SATOB VECTOR MEAN WINDS BETWEEN 401-700 HPA
APRIL 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

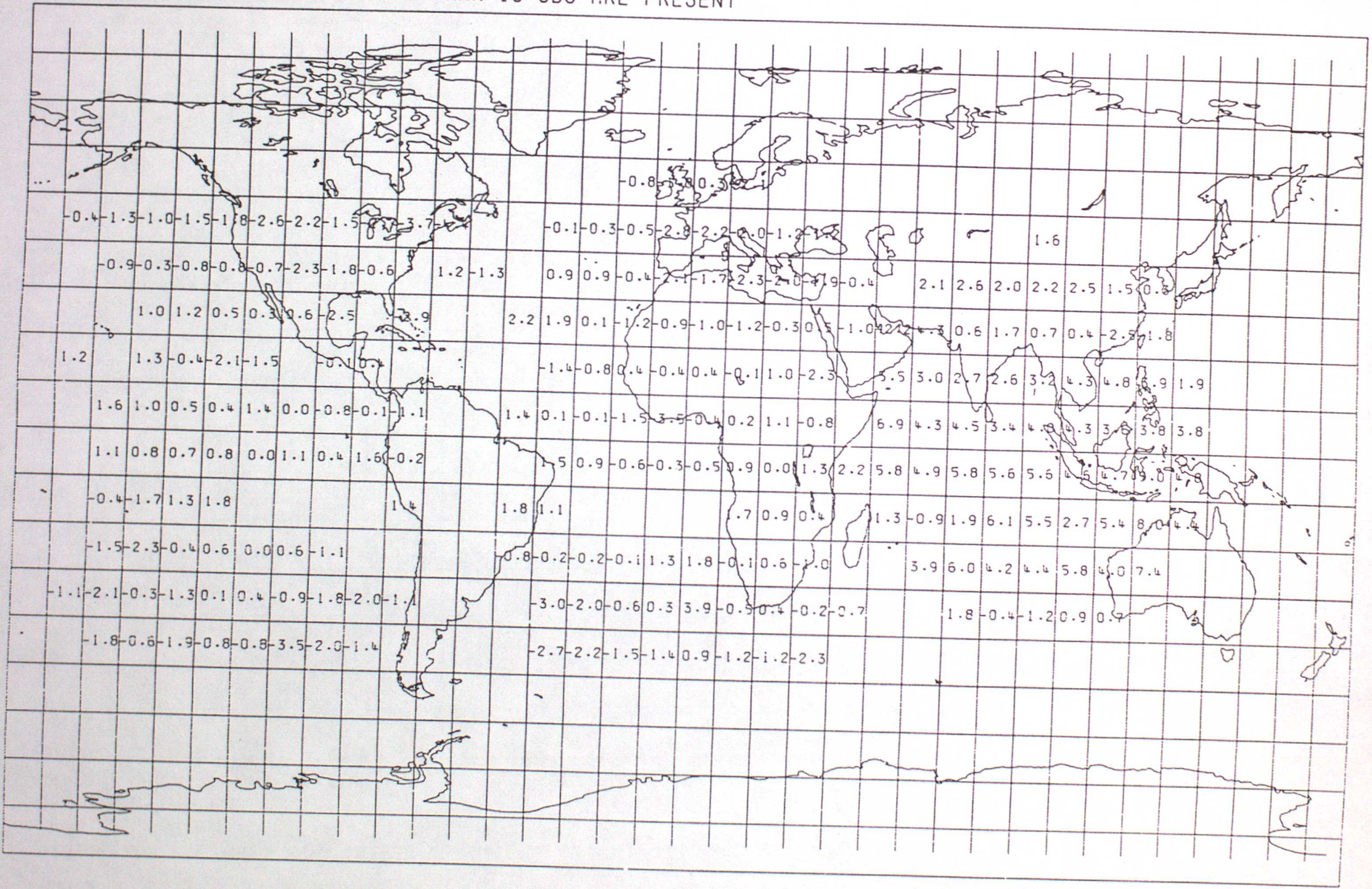

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA
APRIL 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

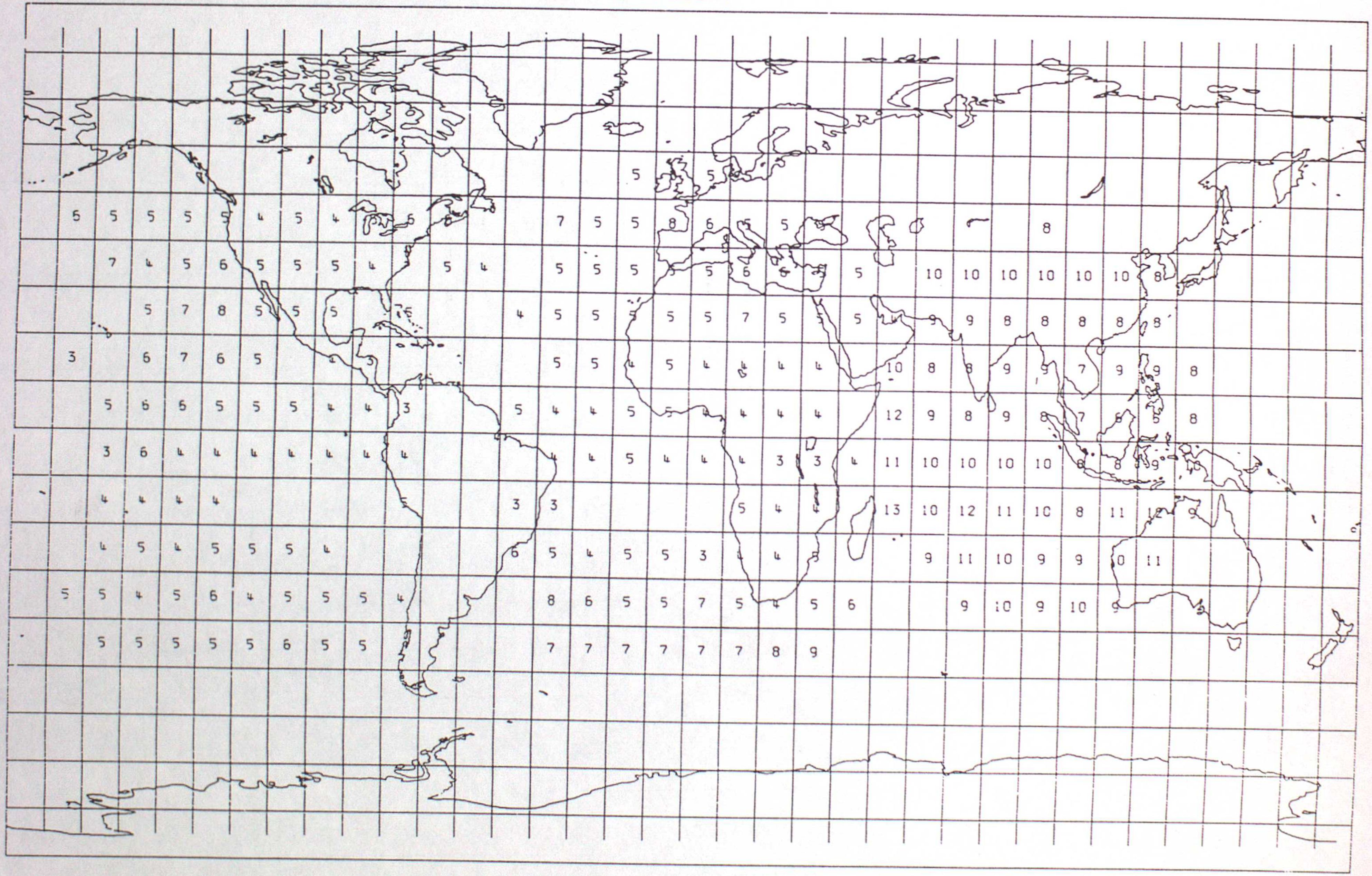
FIGURE 17


REPRESENTS 5 M/S

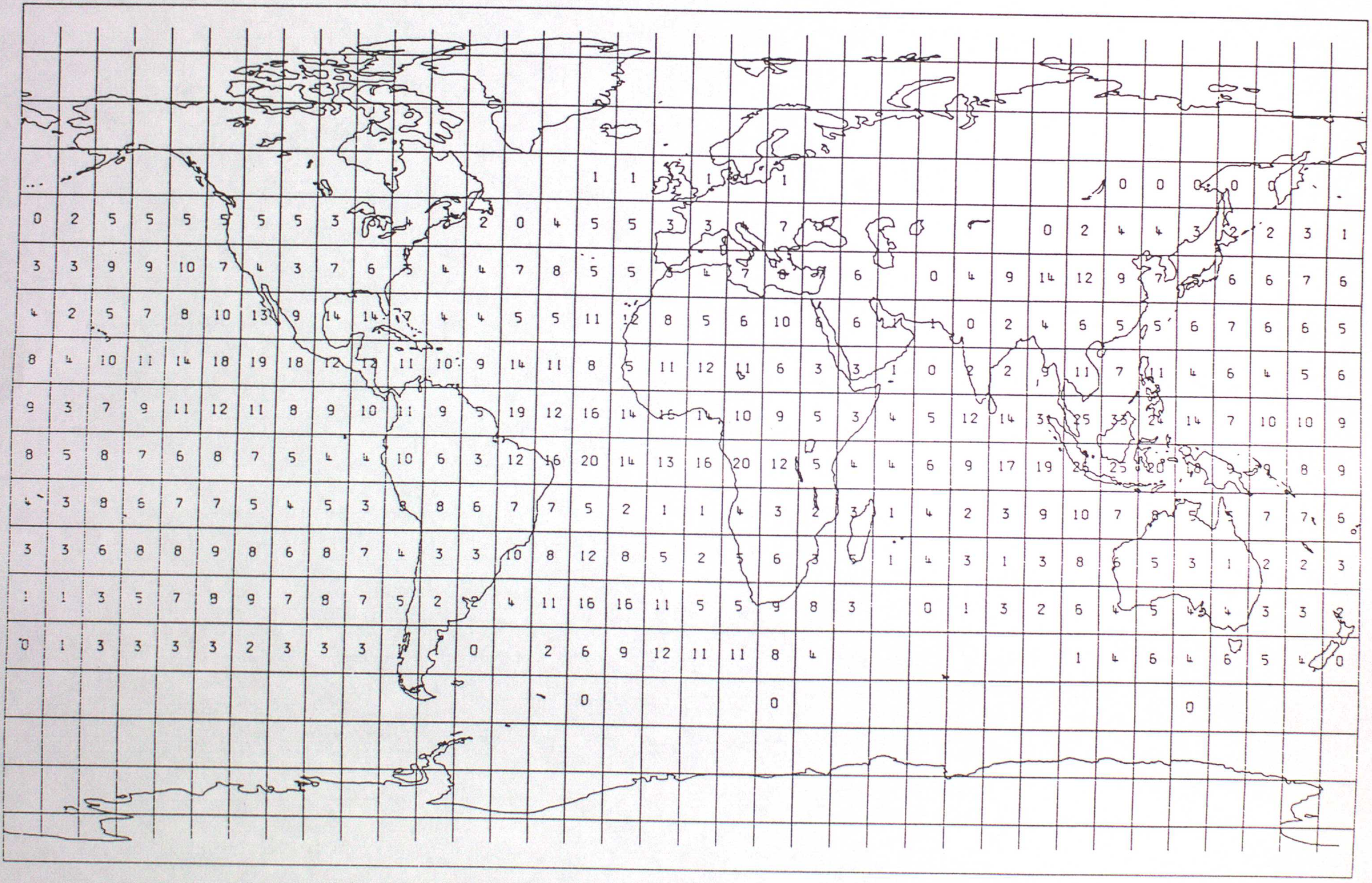
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
APRIL 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-0.8 -1.8 0.3
-0.4 -1.3 -1.0 -1.5 -1.8 -2.6 -2.2 -1.5 -3.7 -0.1 -0.3 -0.5 -2.8 -2.2 -2.0 -1.2 1.6
-0.9 -0.3 -0.8 -0.8 -0.7 -2.3 -1.8 -0.6 1.2 -1.3 0.9 0.9 -0.4 -2.1 -1.7 -2.3 -2.0 -1.9 -0.4 2.1 2.6 2.0 2.2 2.5 1.5 0.3
1.0 1.2 0.5 0.3 0.6 -2.5 3.9 2.2 1.9 0.1 -1.2 -0.9 -1.0 -1.2 -0.3 0.5 -1.0 2.2 4.3 0.6 1.7 0.7 0.4 -2.5 1.8
1.2 1.3 -0.4 -2.1 -1.5 -0.1 0.4 -1.4 -0.8 0.4 -0.4 0.4 -0.1 1.0 -2.3 5.5 3.0 2.7 2.6 3.2 4.3 4.8 6.9 1.9
1.6 1.0 0.5 0.4 1.4 0.0 -0.8 -0.1 -1.1 1.4 0.1 -0.1 -1.5 -3.5 -0.4 0.2 1.1 -0.8 6.9 4.3 4.5 3.4 4.8 4.3 3.8 3.8 3.8
1.1 0.8 0.7 0.8 0.0 1.1 0.4 1.6 -0.2 1.5 0.9 -0.6 -0.3 -0.5 0.9 0.0 1.3 2.2 5.8 4.9 5.8 5.6 5.6 4.5 4.7 9.0 4.8
-0.4 -1.7 1.3 1.8 1.4 1.8 1.1 1.7 0.9 0.4 1.3 -0.9 1.9 6.1 5.5 2.7 5.4 8.0 4.4
-1.5 -2.3 -0.4 0.6 0.0 0.6 -1.1 0.8 -0.2 -0.2 -0.1 1.3 1.8 -0.1 0.6 -1.0 3.9 6.0 4.2 4.4 5.8 4.0 7.4
-1.1 -2.1 -0.3 -1.3 0.1 0.4 -0.9 -1.8 -2.0 -1.1 -3.0 -2.0 -0.6 0.3 3.9 -0.5 0.4 -0.2 -0.7 1.8 -0.4 -1.2 0.9 0.7
-1.8 -0.6 -1.9 -0.8 -0.8 -3.5 -2.0 -1.4 -2.7 -2.2 -1.5 -1.4 0.9 -1.2 -1.2 -2.3

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
APRIL 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT

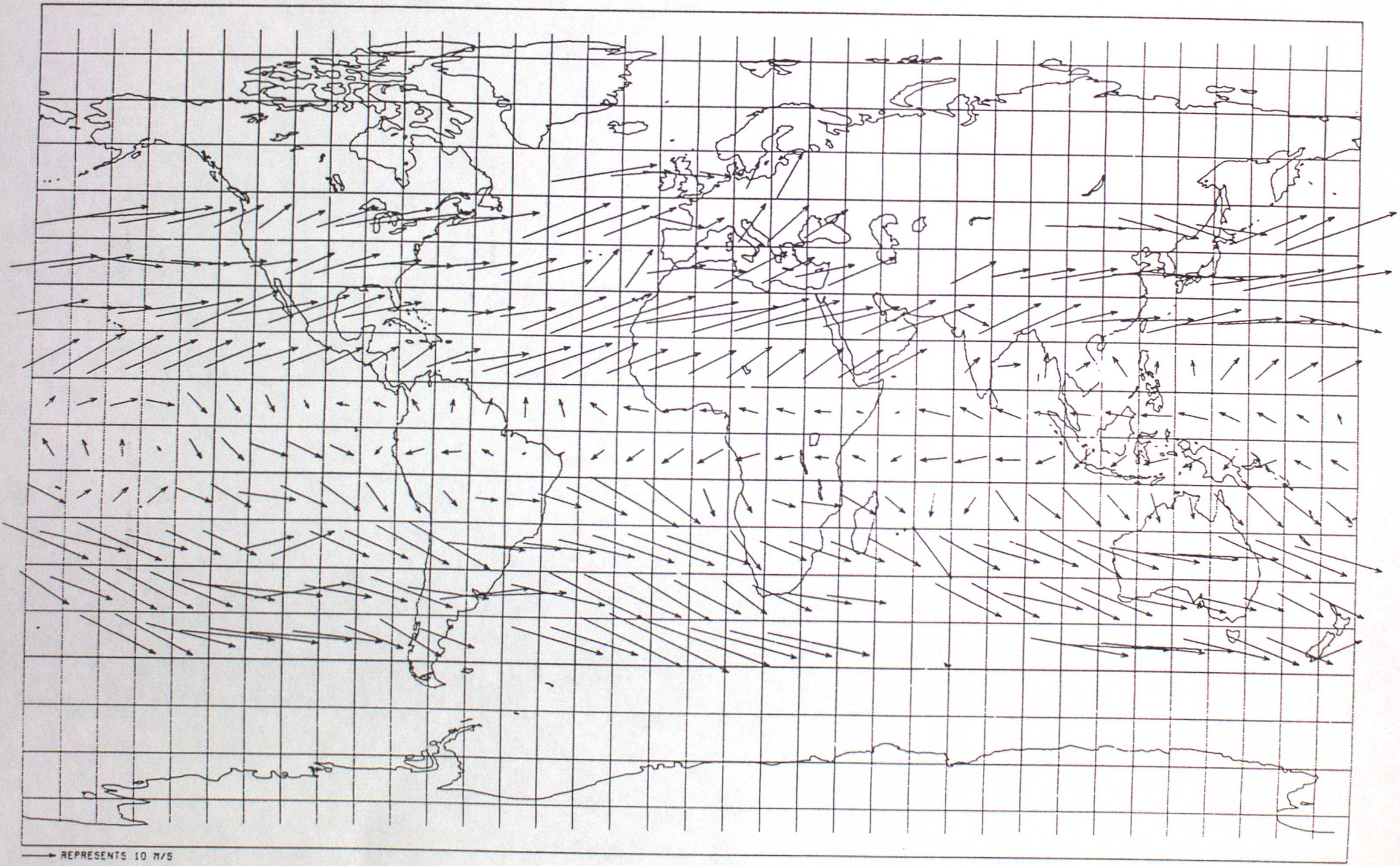

5 5
6 5 5 5 5 4 5 4 6 7 5 5 8 6 5 5 8
7 4 5 6 5 5 5 4 5 4 5 5 5 5 5 6 6 5 5 10 10 10 10 10 10 8
5 7 8 5 5 5 5 4 5 5 5 5 5 7 5 5 5 4 9 9 8 8 8 8 8
3 6 7 6 5 4 3 5 5 4 5 4 4 4 4 10 8 8 9 9 7 9 9 8
5 6 6 5 5 5 4 4 3 5 4 4 5 5 4 4 4 4 12 9 8 9 8 7 6 5 8
3 6 4 4 4 4 4 4 4 4 4 5 4 4 4 3 3 4 11 10 10 10 10 8 8 9 10
4 4 4 4 5 3 3 5 4 4 13 10 12 11 10 8 11 12 9
4 5 4 5 5 5 4 6 5 4 5 5 3 4 4 5 9 11 10 9 9 10 11
5 5 4 5 6 4 5 5 5 4 8 6 5 5 7 5 4 5 6 9 10 9 10 9
5 5 5 5 5 6 5 5 7 7 7 7 7 7 8 9

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
APRIL 1994


1 1 1 1 1 0 0 0 0 0
0 2 5 5 5 5 5 5 3 4 2 0 4 5 5 3 3 7 0 2 4 4 3 2 2 3 1
3 3 9 9 10 7 4 3 7 6 5 4 4 7 8 5 5 3 4 7 8 7 6 0 4 9 14 12 9 7 6 6 7 6
4 2 5 7 8 10 13 9 14 14 7 4 4 5 5 11 12 8 5 6 10 6 6 1 1 0 2 4 6 5 5 6 7 6 6 5
8 4 10 11 14 18 19 18 12 12 11 10 9 14 11 8 5 11 12 11 6 3 3 1 0 2 2 9 11 7 11 4 6 4 5 6
9 3 7 9 11 12 11 8 9 10 11 9 5 19 12 16 14 15 14 10 9 5 3 4 5 12 14 3 25 33 24 14 7 10 10 9
8 5 8 7 6 8 7 5 4 4 10 6 3 12 16 20 14 13 16 20 12 5 4 4 6 9 17 19 25 25 20 18 9 9 8 9
4 3 8 6 7 7 5 4 5 3 3 8 6 7 7 5 2 1 1 4 3 2 3 1 4 2 3 9 10 7 8 5 7 7 6
3 3 6 8 8 9 8 6 8 7 4 3 3 10 8 12 8 5 2 5 6 3 5 1 4 3 1 3 8 6 5 3 1 2 2 3
1 1 3 5 7 8 9 7 8 7 5 2 2 4 11 16 16 11 5 5 9 8 3 0 1 3 2 6 4 5 4 4 3 3 2
0 1 3 3 3 3 2 3 3 3 0 2 6 9 12 11 11 8 4 1 4 6 4 6 5 4 0
0 0 0

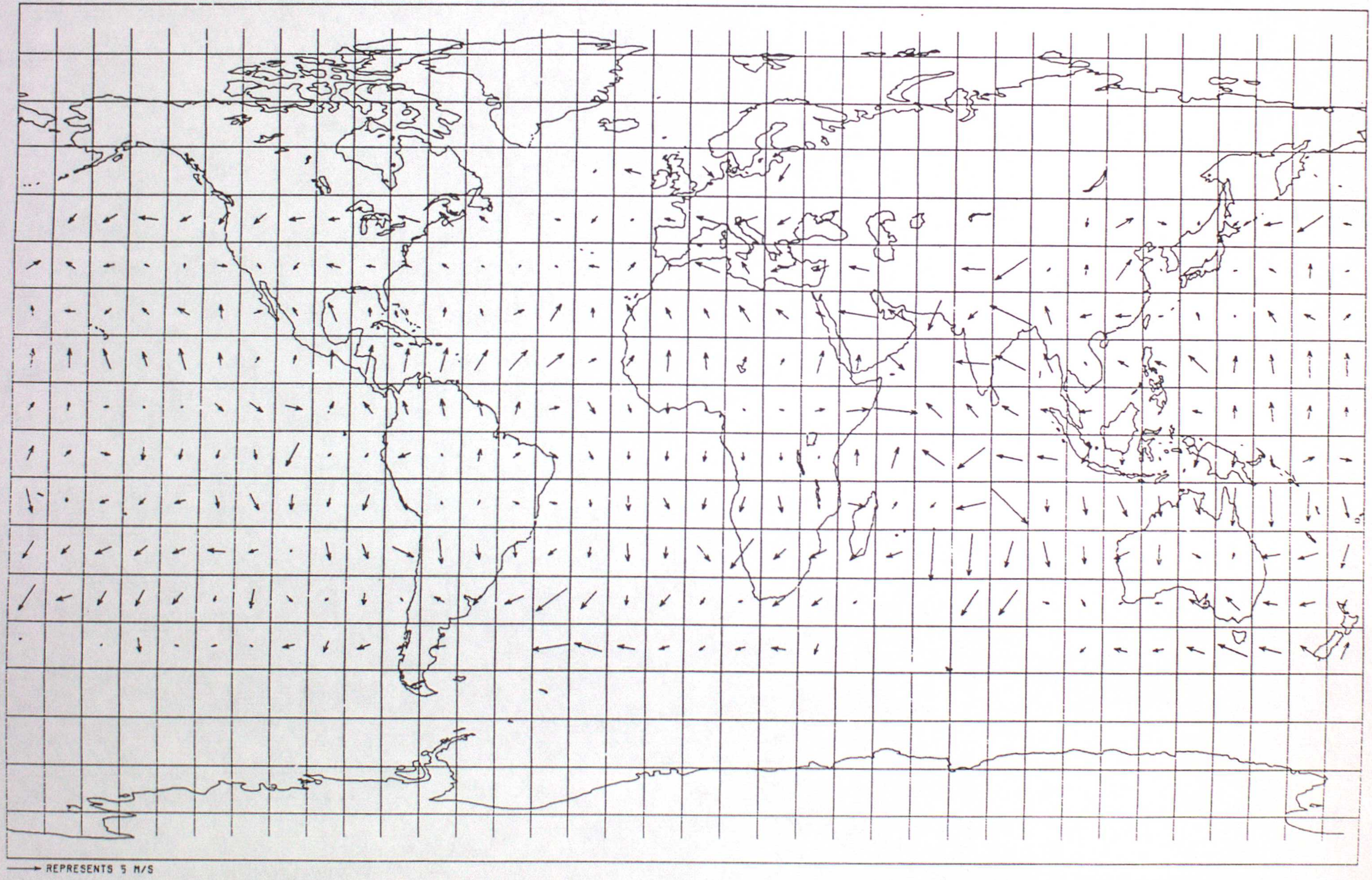
SATOB VECTOR MEAN WINDS BETWEEN 101-400 HPA
APRIL 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 21

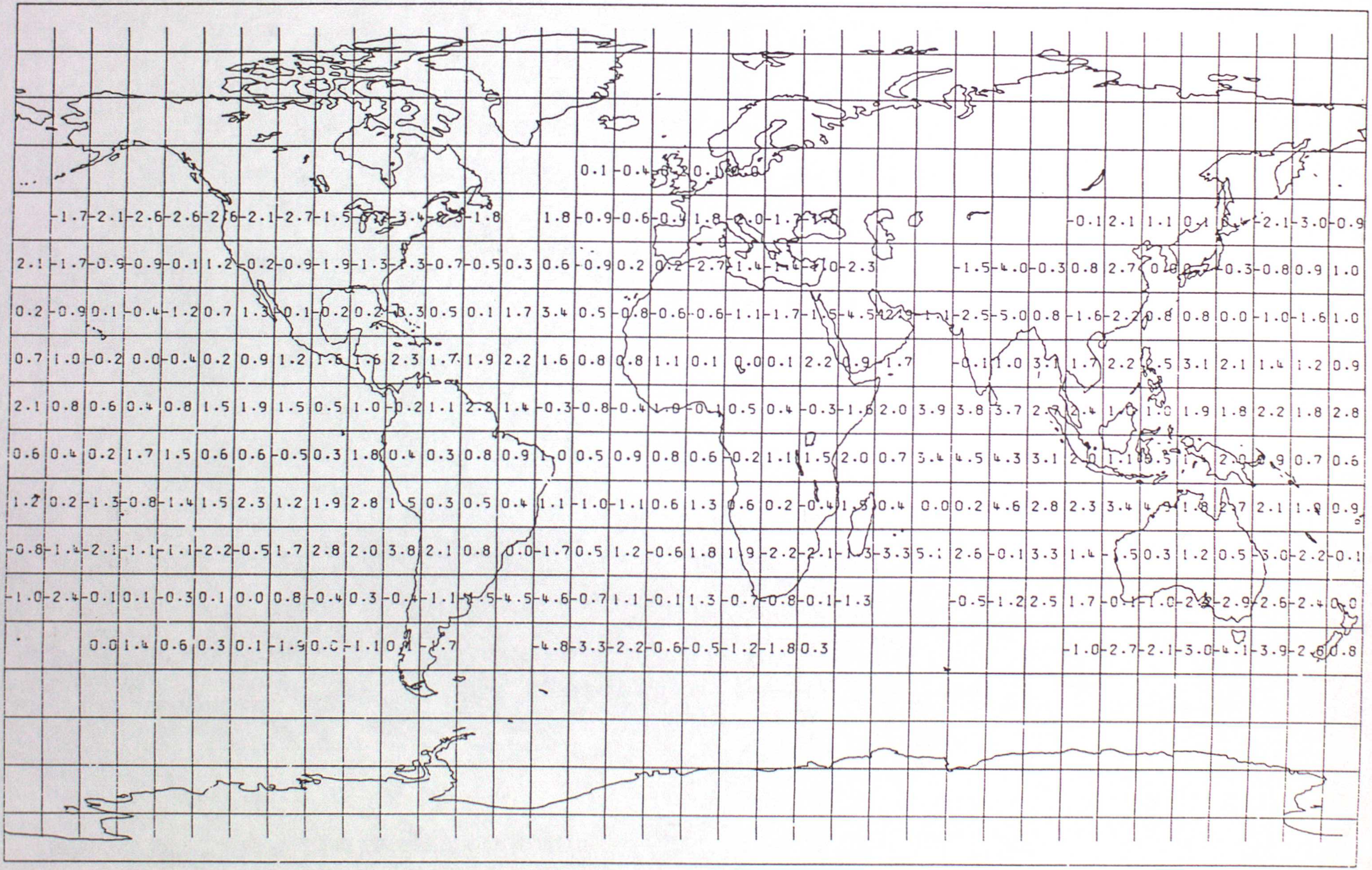

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA
APRIL 1994
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

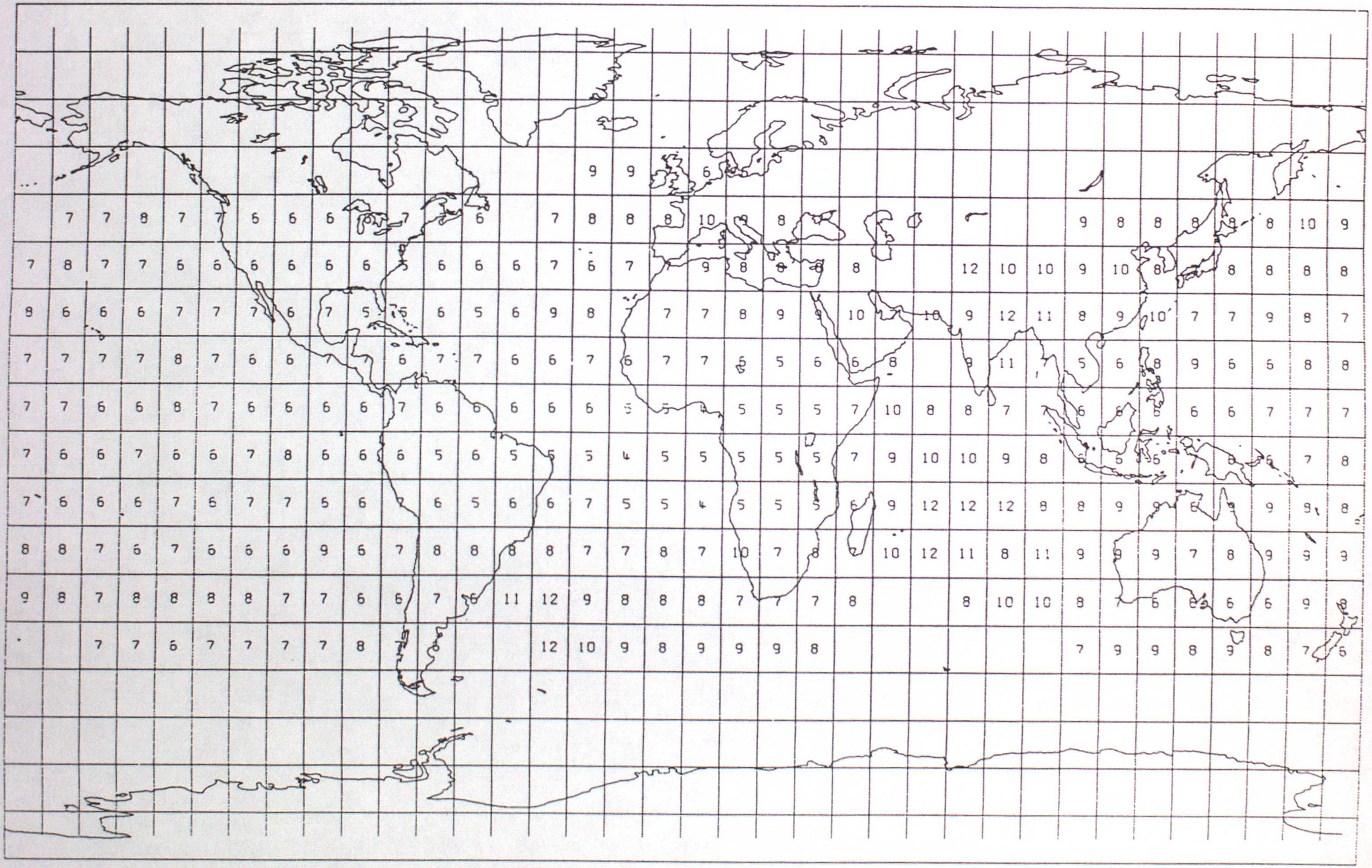
FIGURE 22


REPRESENTS 5 M/S

SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
APRIL 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


0.1 -0.4 -0.2 0.1 0.0
-1.7 -2.1 -2.6 -2.6 -2.6 -2.1 -2.7 -1.5 -0.2 -3.4 -2.3 -1.8 1.8 -0.9 -0.6 -0.4 1.8 -2.0 -1.7 -1.0 -0.1 2.1 1.1 0.1 1.4 -2.1 -3.0 -0.9
2.1 -1.7 -0.9 -0.9 -0.1 1.2 -0.2 -0.9 -1.9 -1.3 -1.3 -0.7 -0.5 0.3 0.6 -0.9 0.2 0.2 -2.7 -1.4 -1.4 -1.0 -2.3 -1.5 -4.0 -0.3 0.8 2.7 0.0 -0.7 -0.3 -0.8 0.9 1.0
0.2 -0.9 0.1 -0.4 -1.2 0.7 1.3 -0.1 -0.2 0.2 -3.3 0.5 0.1 1.7 3.4 0.5 -0.8 -0.6 -0.6 -1.1 -1.7 -1.5 -4.5 -2.9 -1.1 -2.5 -5.0 0.8 -1.6 -2.2 0.8 0.8 0.0 -1.0 -1.6 1.0
0.7 1.0 -0.2 0.0 -0.4 0.2 0.9 1.2 1.6 1.6 2.3 1.7 1.9 2.2 1.6 0.8 0.8 1.1 0.1 0.0 0.1 2.2 0.9 -1.7 -0.1 1.0 3.1 1.7 2.2 2.5 3.1 2.1 1.4 1.2 0.9
2.1 0.8 0.6 0.4 0.8 1.5 1.9 1.5 0.5 1.0 -0.2 1.1 2.8 1.4 -0.3 -0.8 -0.4 -1.0 -0.1 0.5 0.4 -0.3 -1.6 2.0 3.9 3.8 3.7 2.7 2.4 1.0 1.0 1.9 1.8 2.2 1.8 2.8
0.6 0.4 0.2 1.7 1.5 0.6 0.6 -0.5 0.3 1.8 0.4 0.3 0.8 0.9 1.0 0.5 0.9 0.8 0.6 -0.2 1.1 1.5 2.0 0.7 3.4 4.5 4.3 3.1 2.0 1.1 0.5 1.4 2.0 0.9 0.7 0.6
1.2 0.2 -1.3 -0.8 -1.4 1.5 2.3 1.2 1.9 2.8 1.5 0.3 0.5 0.4 1.1 -1.0 -1.1 0.6 1.3 0.6 0.2 -0.4 1.5 0.4 0.0 0.2 4.6 2.8 2.3 3.4 4.9 1.8 2.7 2.1 1.9 0.9
-0.8 -1.4 -2.1 -1.1 -1.1 -2.2 -0.5 1.7 2.8 2.0 3.8 2.1 0.8 0.0 -1.7 0.5 1.2 -0.6 1.8 1.9 -2.2 -2.1 -1.3 -3.3 5.1 2.6 -0.1 3.3 1.4 -1.5 0.3 1.2 0.5 -3.0 -2.2 -0.1
-1.0 -2.4 -0.1 0.1 -0.3 0.1 0.0 0.8 -0.4 0.3 -0.4 -1.1 -4.5 -4.5 -4.6 -0.7 1.1 -0.1 1.3 -0.7 -0.8 -0.1 -1.3 -0.5 -1.2 2.5 1.7 -0.1 -1.0 -2.2 -2.9 -2.6 -2.4 0.0
0.0 1.4 0.6 0.3 0.1 -1.9 0.0 -1.1 0.1 -1.7 -4.8 -3.3 -2.2 -0.6 -0.5 -1.2 -1.8 0.3 -1.0 -2.7 -2.1 -3.0 -4.1 -3.9 -2.6 0.8

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
APRIL 1994
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH:April, 94

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-11, NOAA-12 500 km.

Standard of comparison :Background field from Bracknell global model.

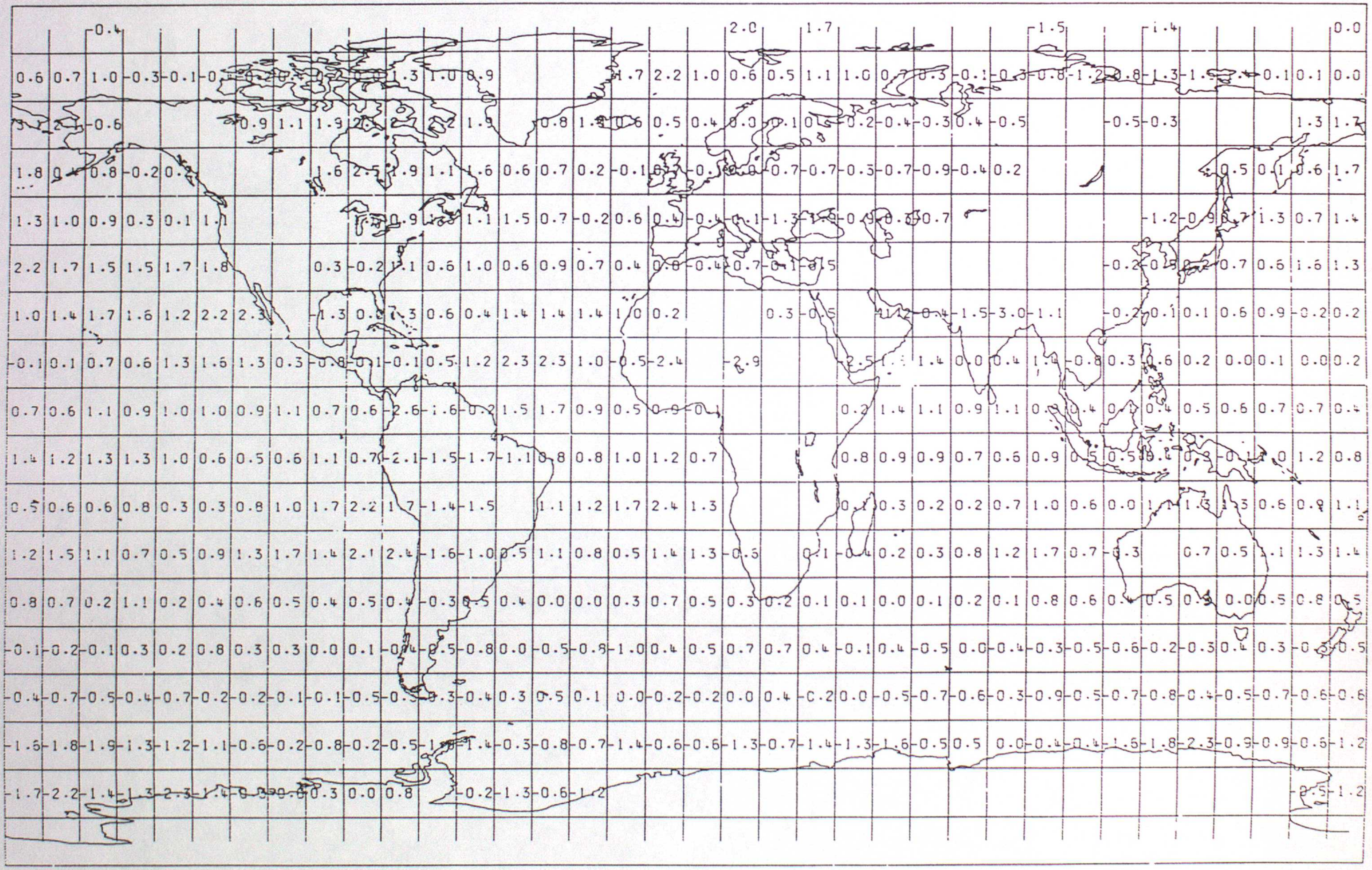
Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer:850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

:Mean observation minus background temperature differences

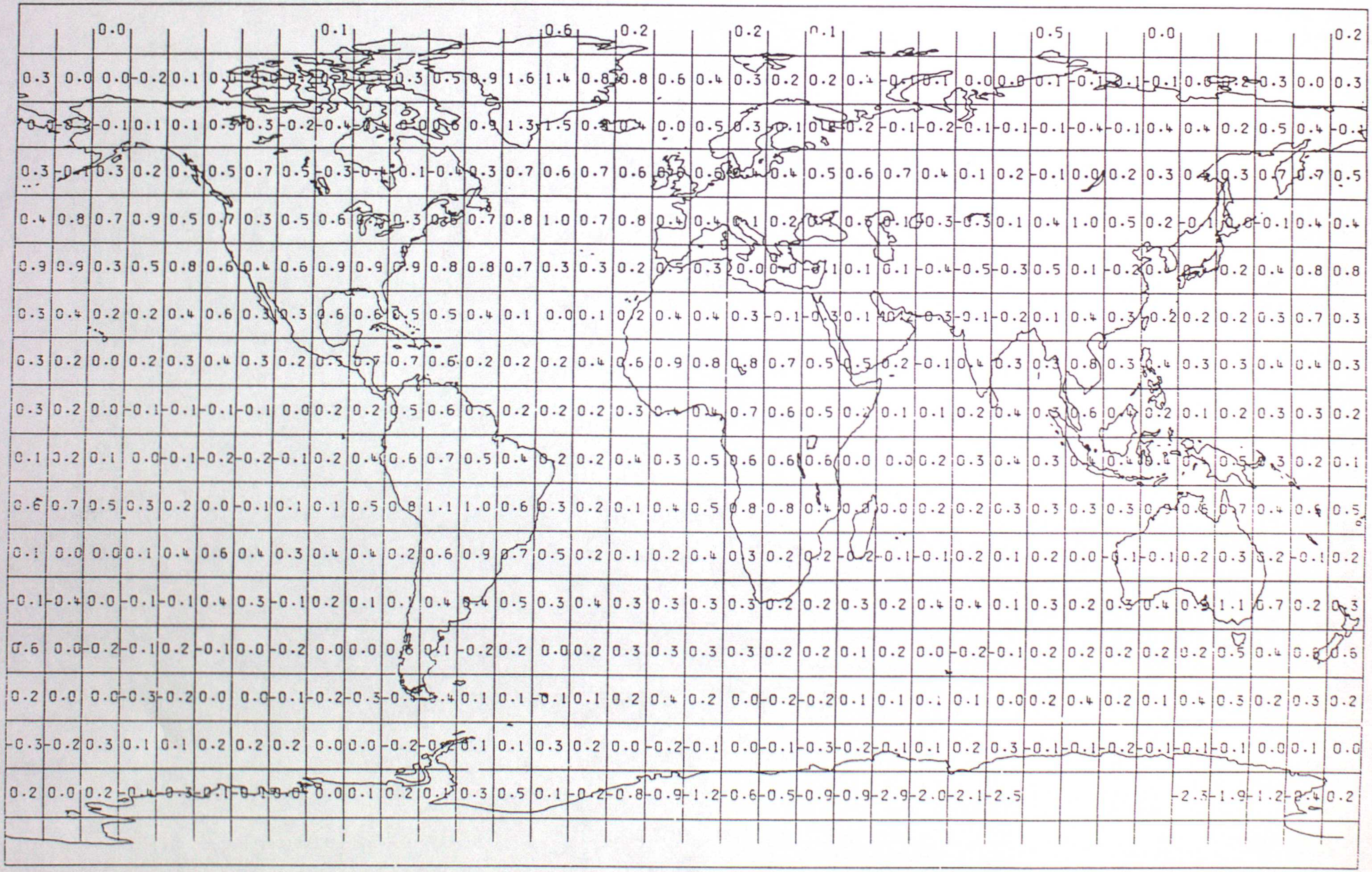
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
APRIL 1994
NOAA-11, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 25


-0.4 2.0 1.7 -1.5 1.4 0.0
0.6 0.7 1.0 -0.3 -0.1 1.3 1.0 0.9 1.7 2.2 1.0 0.6 0.5 1.1 1.0 -0.1 -0.8 -1.2 -1.3 0.1 0.1 0.0
-0.6 0.9 1.1 1.9 1.9 0.8 0.5 0.4 -0.2 -0.4 -0.3 0.4 -0.5 -0.5 -0.3 1.3 1.7
1.8 0.8 -0.2 1.6 2.5 1.9 1.1 1.6 0.6 0.7 0.2 -0.1 -0.7 -0.7 -0.3 -0.7 -0.9 -0.4 0.2 0.5 0.1 0.6 1.7
1.3 1.0 0.9 0.3 0.1 0.9 1.1 1.5 0.7 -0.2 0.6 0.4 -0.4 -1.3 0.7 -1.2 1.3 0.7 1.4
2.2 1.7 1.5 1.5 1.7 1.8 0.3 -0.2 1.1 0.6 1.0 0.6 0.9 0.7 0.4 -0.4 0.7 -0.2 0.7 0.6 1.6 1.3
1.0 1.4 1.7 1.6 1.2 2.2 2.3 -1.3 0.6 0.4 1.4 1.4 1.4 1.0 0.2 0.3 -0.5 -0.4 -1.5 -3.0 -1.1 -0.2 0.1 0.1 0.6 0.9 -0.2 0.2
-0.1 0.1 0.7 0.6 1.3 1.6 1.3 0.3 -0.8 -0.1 0.5 1.2 2.3 2.3 1.0 -0.5 -2.4 -2.9 2.5 1.4 0.0 0.4 -0.8 0.3 0.6 0.2 0.0 0.1 0.0 0.2
0.7 0.6 1.1 0.9 1.0 1.0 0.9 1.1 0.7 0.6 -2.6 -1.6 1.5 1.7 0.9 0.5 0.2 1.4 1.1 0.9 1.1 0.4 0.4 0.5 0.6 0.7 0.7 0.4
1.4 1.2 1.3 1.3 1.0 0.6 0.5 0.6 1.1 0.7 -2.1 -1.5 -1.7 -1.1 0.8 0.8 1.0 1.2 0.7 0.8 0.9 0.9 0.7 0.6 0.9 0.5 1.2 0.8
0.5 0.6 0.6 0.8 0.3 0.3 0.8 1.0 1.7 2.2 1.7 -1.4 -1.5 1.1 1.2 1.7 2.4 1.3 0.3 0.2 0.2 0.7 1.0 0.6 0.0 1.3 0.6 0.9 1.1
1.2 1.5 1.1 0.7 0.5 0.9 1.3 1.7 1.4 2.1 2.4 -1.6 -1.0 1.1 0.8 0.5 1.4 1.3 -0.4 0.2 0.3 0.8 1.2 1.7 0.7 0.7 0.5 1.3 1.4
0.8 0.7 0.2 1.1 0.2 0.4 0.6 0.5 0.4 0.5 -0.3 0.4 0.0 0.0 0.3 0.7 0.5 0.3 0.2 0.1 0.1 0.0 0.1 0.2 0.1 0.8 0.6 0.5 0.0 0.5 0.8
-0.1 -0.2 -0.1 0.3 0.2 0.8 0.3 0.3 0.0 0.1 -0.5 -0.8 0.0 -0.5 -0.8 -1.0 0.4 0.5 0.7 0.7 0.4 -0.1 0.4 -0.5 0.0 -0.4 -0.3 -0.5 -0.6 -0.2 -0.3 0.4 0.3 -0.5
-0.4 -0.7 -0.5 -0.4 -0.7 -0.2 -0.2 -0.1 -0.1 -0.5 -0.3 -0.4 0.3 0.5 0.1 0.0 -0.2 -0.2 0.0 0.4 -0.2 0.0 -0.5 -0.7 -0.6 -0.3 -0.9 -0.5 -0.7 -0.8 -0.4 -0.5 -0.7 -0.6 -0.6
-1.6 -1.8 -1.9 -1.3 -1.2 -1.1 -0.6 -0.2 -0.8 -0.2 -0.5 -1.4 -0.3 -0.8 -0.7 -1.4 -0.6 -0.6 -1.3 -0.7 -1.4 -1.3 -1.6 -0.5 0.5 0.0 -0.4 -0.4 -1.5 -1.8 -2.3 -0.9 -0.9 -0.5 -1.2
-1.7 -2.2 -1.4 -1.3 -2.3 -1.4 0.3 0.0 0.8 -0.2 -1.3 -0.6 -1.2 -0.5 -1.2

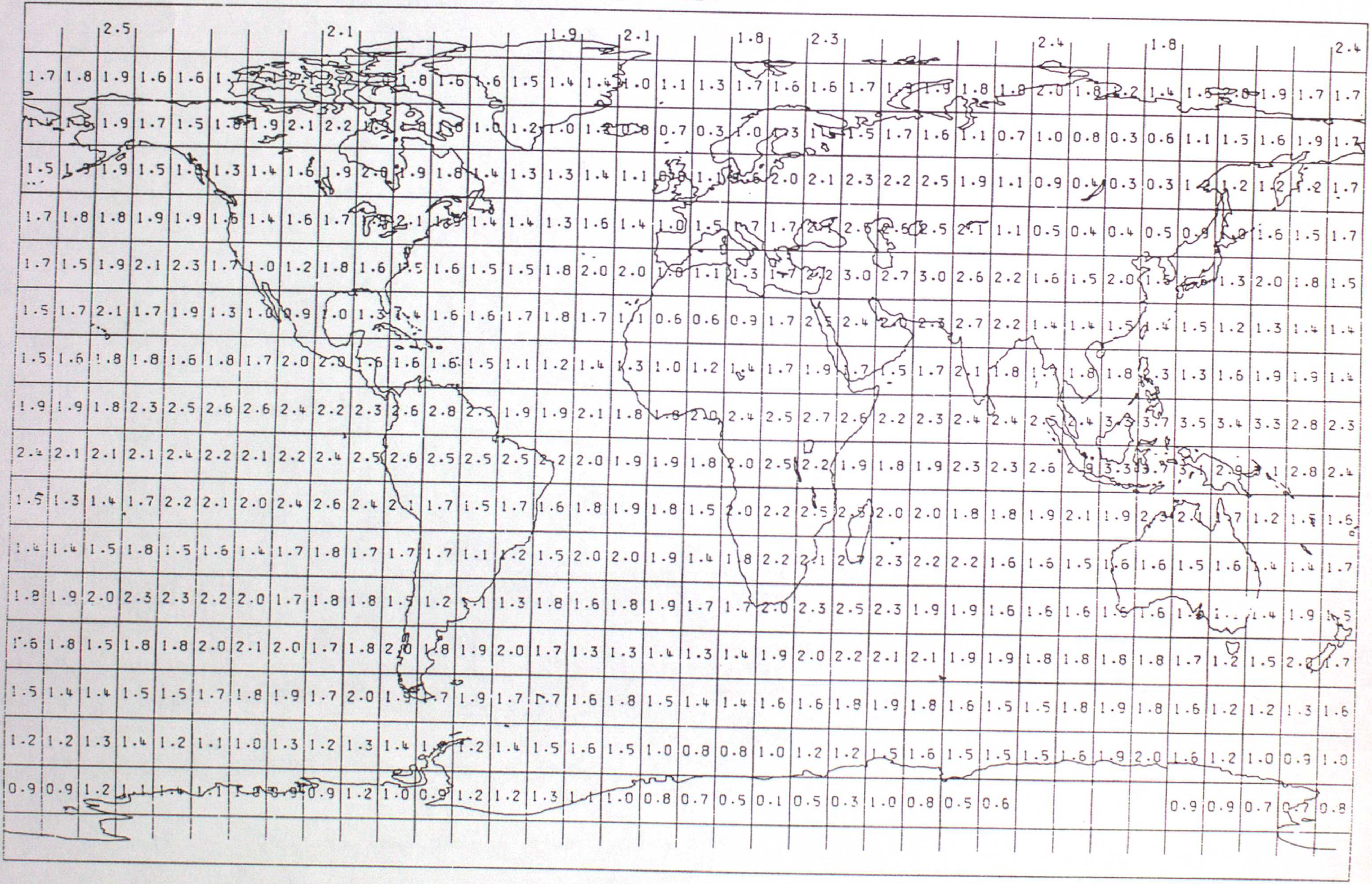
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
APRIL 1994
NOAA-11, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 26


0.0 0.1 0.6 0.2 0.2 0.1 0.5 0.0 0.2
0.3 0.0 0.0 -0.2 0.1 0.3 0.5 0.9 1.6 1.4 0.8 0.8 0.6 0.4 0.3 0.2 0.2 0.0 -0.1 -0.3 0.0 0.3
-0.1 0.1 0.1 0.3 0.3 -0.2 -0.4 0.9 1.3 1.5 0.0 0.5 0.3 -0.2 -0.1 -0.2 -0.1 -0.1 -0.1 -0.4 -0.1 0.4 0.4 0.2 0.5 0.4
0.3 0.3 0.2 0.5 0.7 0.5 -0.3 -0.1 -0.4 0.3 0.7 0.6 0.7 0.6 0.4 0.5 0.6 0.7 0.4 0.1 0.2 -0.1 0.2 0.3 0.3 0.7 0.7 0.5
0.4 0.8 0.7 0.9 0.5 0.7 0.3 0.5 0.6 0.3 0.7 0.8 1.0 0.7 0.8 0.4 0.4 0.1 0.2 -0.3 -0.3 0.1 0.4 1.0 0.5 0.2 -0.1 0.4 0.4
0.9 0.9 0.3 0.5 0.8 0.6 0.4 0.6 0.9 0.9 0.9 0.8 0.8 0.7 0.3 0.3 0.2 0.3 0.0 0.1 0.1 -0.4 -0.5 -0.3 0.5 0.1 -0.2 0.2 0.4 0.8 0.8
0.3 0.4 0.2 0.2 0.4 0.6 0.3 0.3 0.6 0.6 0.5 0.5 0.4 0.1 0.0 0.1 0.2 0.4 0.4 0.3 -0.1 -0.3 0.1 -0.3 -0.1 -0.2 0.1 0.4 0.3 0.2 0.2 0.2 0.3 0.7 0.3
0.3 0.2 0.0 0.2 0.3 0.4 0.3 0.2 0.7 0.6 0.2 0.2 0.2 0.4 0.6 0.9 0.8 0.8 0.7 0.5 0.5 -0.2 -0.1 0.4 0.3 0.3 0.8 0.3 0.4 0.3 0.3 0.4 0.4 0.3
0.3 0.2 0.0 -0.1 -0.1 -0.1 -0.1 0.0 0.2 0.2 0.5 0.6 0.5 0.2 0.2 0.2 0.3 0.4 0.7 0.6 0.5 0.1 0.1 0.2 0.4 0.6 0.2 0.1 0.2 0.3 0.3 0.2
0.1 0.2 0.1 0.0 -0.1 -0.2 -0.2 -0.1 0.2 0.4 0.6 0.7 0.5 0.4 0.2 0.2 0.4 0.3 0.5 0.6 0.6 0.6 0.0 0.0 0.2 0.3 0.4 0.3 0.4 0.5 0.3 0.2 0.1
0.6 0.7 0.5 0.3 0.2 0.0 -0.1 0.1 0.1 0.5 0.8 1.1 1.0 0.6 0.3 0.2 0.1 0.4 0.5 0.8 0.8 0.4 0.0 0.2 0.2 0.3 0.3 0.3 0.3 0.6 0.7 0.4 0.6 0.5
0.1 0.0 0.0 0.1 0.4 0.6 0.4 0.3 0.4 0.4 0.2 0.6 0.9 0.7 0.5 0.2 0.1 0.2 0.4 0.3 0.2 0.2 -0.2 -0.1 -0.1 0.2 0.1 0.2 0.0 -0.1 -0.1 0.2 0.3 0.2 -0.1 0.2
-0.1 -0.4 0.0 -0.1 -0.1 0.4 0.3 -0.1 0.2 0.1 0.4 0.4 0.5 0.3 0.4 0.3 0.3 0.3 0.3 0.2 0.2 0.3 0.2 0.4 0.4 0.1 0.3 0.2 0.4 1.1 0.7 0.2 0.3
0.6 0.0 -0.2 -0.1 0.2 -0.1 0.0 -0.2 0.0 0.0 0.6 0.1 -0.2 0.2 0.0 0.2 0.3 0.3 0.3 0.3 0.2 0.2 0.1 0.2 0.0 -0.2 -0.1 0.2 0.2 0.2 0.2 0.2 0.5 0.4 0.6
0.2 0.0 0.0 -0.3 -0.2 0.0 0.0 -0.1 -0.2 -0.3 0.4 0.1 0.1 -0.1 0.1 0.2 0.4 0.2 0.0 -0.2 -0.2 0.1 0.1 0.1 0.1 0.0 0.2 0.4 0.2 0.1 0.4 0.3 0.2 0.3 0.2
-0.3 -0.2 0.3 0.1 0.1 0.2 0.2 0.2 0.0 0.0 -0.2 0.1 0.1 0.3 0.2 0.0 -0.2 -0.1 0.0 -0.1 -0.3 -0.2 -0.1 0.1 0.2 0.3 -0.1 -0.1 -0.2 -0.1 -0.1 -0.1 0.0 0.1 0.0
0.2 0.0 0.2 -0.4 -0.3 0.1 0.0 0.0 0.1 0.2 0.1 0.3 0.5 0.1 -0.2 -0.8 -0.9 -1.2 -0.6 -0.5 -0.9 -0.9 -2.9 -2.0 -2.1 -2.5 -2.3 -1.9 -1.2 -2.4 0.2

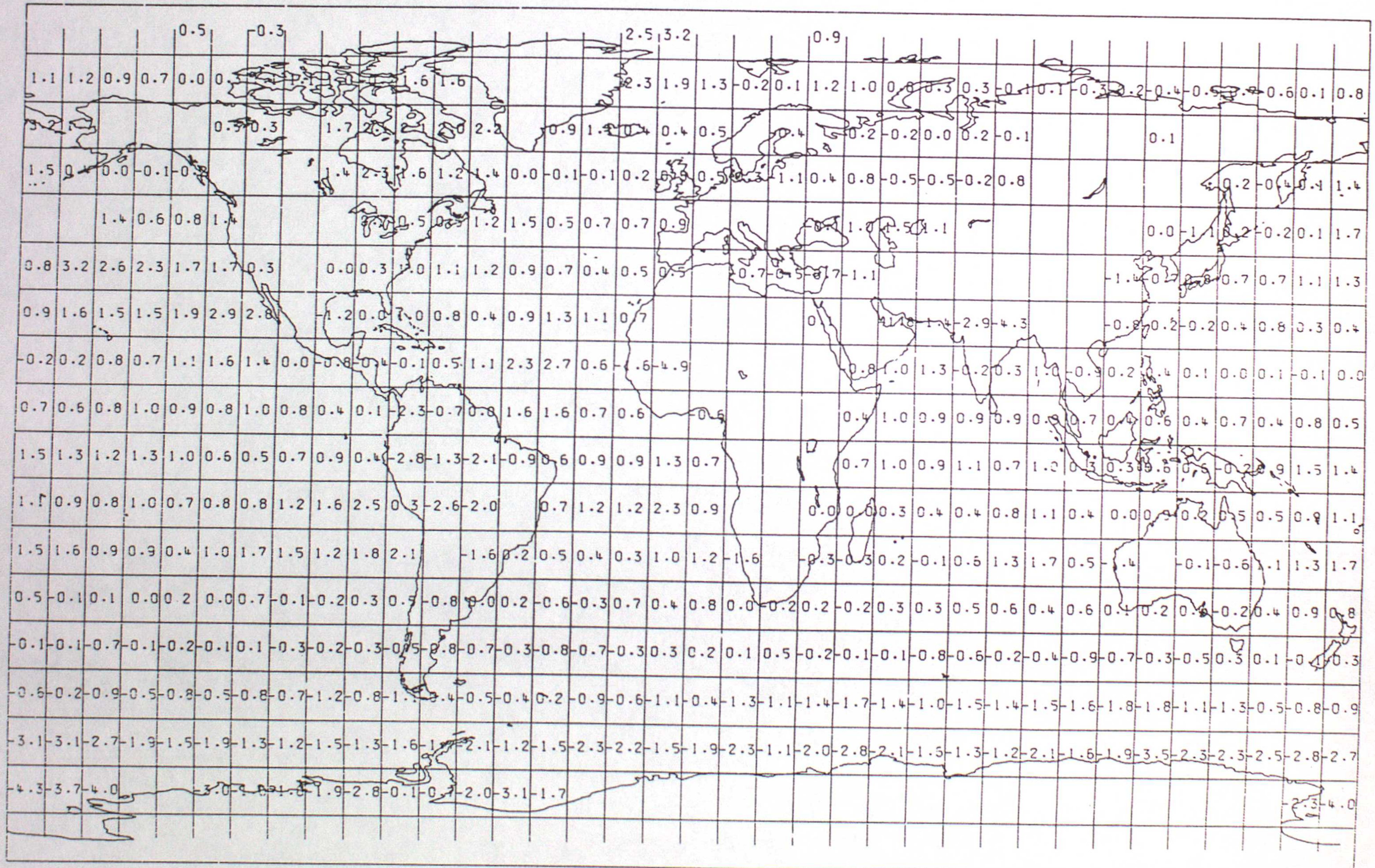
500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
APRIL 1994
NOAA-11, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 27

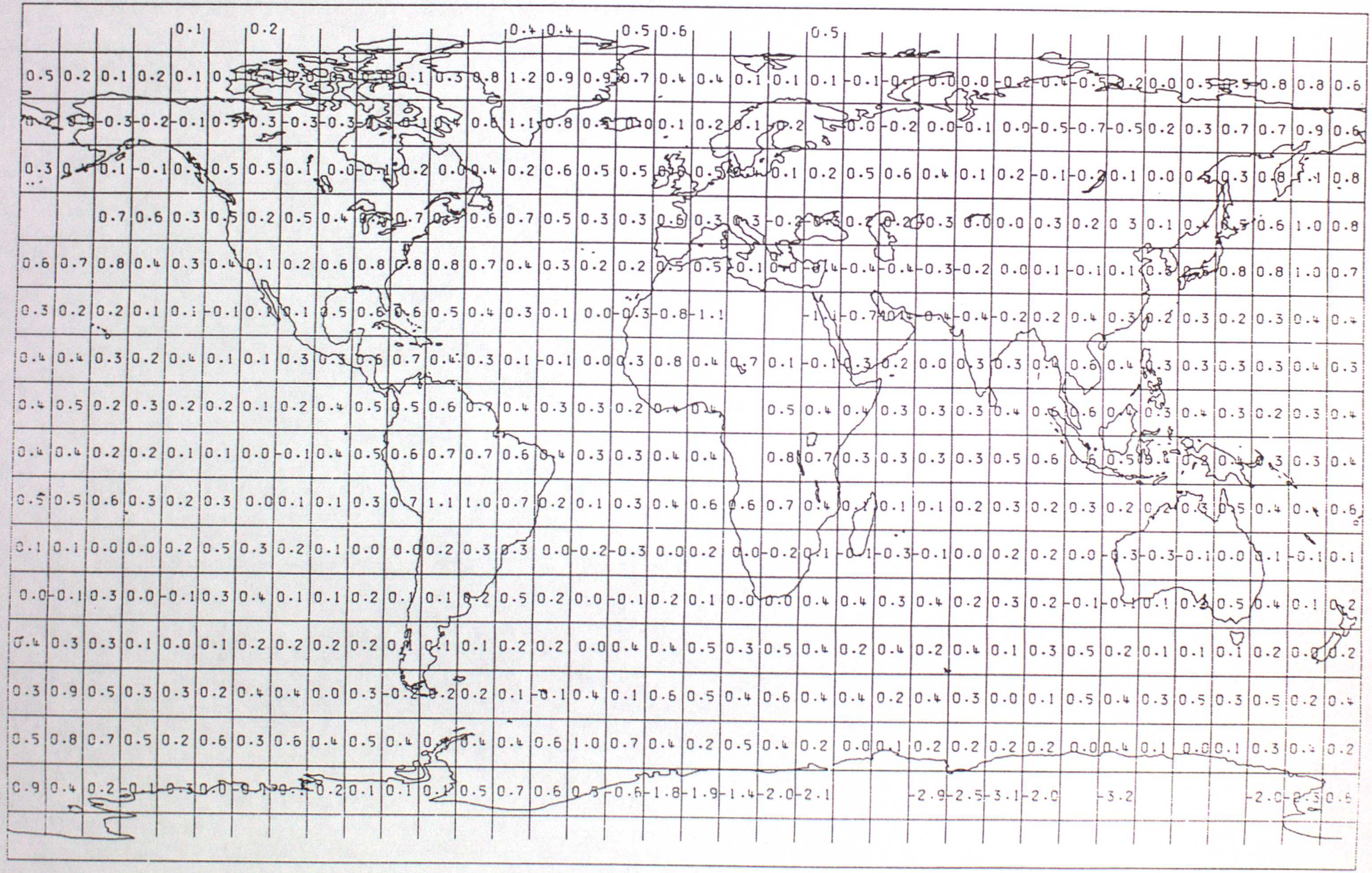

2.5 2.1 1.9 2.1 1.8 2.3 2.4 1.8 2.4
1.7 1.8 1.9 1.6 1.6 1.7 2.1 2.1 2.2 2.0 1.8 1.6 1.6 1.5 1.4 1.4 1.0 1.1 1.3 1.7 1.6 1.6 1.7 1.3 1.9 1.8 1.8 2.0 1.8 2.2 1.4 1.5 2.0 1.9 1.7 1.7
1.4 1.6 1.9 1.7 1.5 1.8 1.9 2.1 2.2 1.9 1.8 1.8 1.0 1.2 1.0 1.3 0.8 0.7 0.3 1.0 1.3 1.5 1.5 1.7 1.6 1.1 0.7 1.0 0.8 0.3 0.6 1.1 1.5 1.6 1.9 1.7
1.5 1.3 1.9 1.5 1.8 1.3 1.4 1.6 1.9 2.0 1.9 1.8 1.4 1.3 1.3 1.4 1.1 0.8 1.1 1.6 2.0 2.1 2.3 2.2 2.5 1.9 1.1 0.9 0.4 0.3 0.3 1.2 1.2 1.2 1.2 1.7
1.7 1.8 1.8 1.9 1.9 1.6 1.4 1.6 1.7 1.9 2.1 1.9 1.4 1.4 1.3 1.6 1.4 1.0 1.5 1.7 1.7 2.1 2.6 2.6 2.5 2.1 1.1 0.5 0.4 0.4 0.5 0.9 1.0 1.6 1.5 1.7
1.7 1.5 1.9 2.1 2.3 1.7 1.0 1.2 1.8 1.6 1.5 1.6 1.5 1.5 1.8 2.0 2.0 1.8 1.1 1.3 1.7 2.2 3.0 2.7 3.0 2.6 2.2 1.6 1.5 2.0 1.5 1.6 1.3 2.0 1.8 1.5
1.5 1.7 2.1 1.7 1.9 1.3 1.0 0.9 1.0 1.3 1.4 1.6 1.6 1.7 1.8 1.7 1.1 0.6 0.6 0.9 1.7 2.5 2.4 2.0 2.3 2.7 2.2 1.4 1.4 1.5 1.4 1.5 1.2 1.3 1.4 1.4
1.5 1.6 1.8 1.8 1.6 1.8 1.7 2.0 2.0 1.6 1.6 1.6 1.5 1.1 1.2 1.4 1.3 1.0 1.2 1.4 1.7 1.9 1.7 1.5 1.7 2.1 1.8 1.7 1.8 1.8 2.3 1.3 1.6 1.9 1.9 1.4
1.9 1.9 1.8 2.3 2.5 2.6 2.6 2.4 2.2 2.3 2.6 2.8 2.5 1.9 1.9 2.1 1.8 1.8 2.0 2.4 2.5 2.7 2.6 2.2 2.3 2.4 2.4 2.5 2.4 3.3 3.7 3.5 3.4 3.3 2.8 2.3
2.4 2.1 2.1 2.1 2.4 2.2 2.1 2.2 2.4 2.5 2.6 2.5 2.5 2.5 2.2 2.0 1.9 1.9 1.8 2.0 2.5 2.2 1.9 1.8 1.9 2.3 2.3 2.6 2.9 3.3 3.7 3.1 2.9 3.1 2.8 2.4
1.5 1.3 1.4 1.7 2.2 2.1 2.0 2.4 2.6 2.4 2.1 1.7 1.5 1.7 1.6 1.8 1.9 1.8 1.5 2.0 2.2 2.5 2.5 2.0 2.0 1.8 1.8 1.9 2.1 1.9 2.3 2.1 1.7 1.2 1.5 1.6
1.4 1.4 1.5 1.8 1.5 1.6 1.4 1.7 1.8 1.7 1.7 1.7 1.1 1.2 1.5 2.0 2.0 1.9 1.4 1.8 2.2 2.1 2.7 2.3 2.2 2.2 1.6 1.6 1.5 1.6 1.6 1.5 1.6 1.4 1.4 1.7
1.8 1.9 2.0 2.3 2.3 2.2 2.0 1.7 1.8 1.8 1.5 1.2 1.1 1.3 1.8 1.6 1.8 1.9 1.7 1.7 2.0 2.3 2.5 2.3 1.9 1.9 1.6 1.6 1.6 1.5 1.6 1.6 1.4 1.4 1.9 1.5
1.6 1.8 1.5 1.8 1.8 2.0 2.1 2.0 1.7 1.8 2.0 1.8 1.9 2.0 1.7 1.3 1.3 1.4 1.3 1.4 1.9 2.0 2.2 2.1 2.1 1.9 1.9 1.8 1.8 1.8 1.8 1.7 1.2 1.5 2.0 1.7
1.5 1.4 1.4 1.5 1.5 1.7 1.8 1.9 1.7 2.0 1.9 1.7 1.9 1.7 1.7 1.6 1.8 1.5 1.4 1.4 1.6 1.6 1.8 1.9 1.8 1.6 1.5 1.5 1.8 1.9 1.8 1.6 1.2 1.2 1.3 1.6
1.2 1.2 1.3 1.4 1.2 1.1 1.0 1.3 1.2 1.3 1.4 1.4 1.2 1.4 1.5 1.6 1.5 1.0 0.8 0.8 1.0 1.2 1.2 1.5 1.6 1.5 1.5 1.5 1.6 1.9 2.0 1.6 1.2 1.0 0.9 1.0
0.9 0.9 1.2 1.1 1.4 1.1 1.0 0.9 0.9 1.2 1.0 0.9 1.2 1.2 1.3 1.1 1.0 0.8 0.7 0.5 0.1 0.5 0.3 1.0 0.8 0.5 0.6 0.9 0.9 0.7 0.7 0.8

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 850 TO 1000 HPA
APRIL 1994
NOAA-12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 28



500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 100 TO 300 HPA
APRIL 1994
FIGURE 29
NOAA-12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT


0.1 0.2 0.4 0.4 0.5 0.6 0.5
0.5 0.2 0.1 0.2 0.1 0.1 0.3 0.8 1.2 0.9 0.9 0.7 0.4 0.4 0.1 0.1 0.1 -0.1 0.0 0.0 -0.2 -0.4 -0.5 0.2 0.0 0.3 0.5 -0.8 0.8 0.6
-0.3 -0.2 -0.1 0.3 -0.3 -0.3 -0.3 0.1 0.4 0.6 1.1 0.8 0.5 0.0 0.1 0.2 0.1 -0.2 -0.0 -0.2 0.0 -0.1 0.0 -0.5 -0.7 -0.5 0.2 0.3 0.7 0.7 0.9 0.6
0.3 0.4 0.1 -0.1 0.3 0.5 0.5 0.1 0.0 -0.1 0.2 0.0 0.4 0.2 0.6 0.5 0.5 0.6 0.5 0.1 0.2 0.5 0.6 0.4 0.1 0.2 -0.1 -0.2 0.1 0.0 0.4 0.3 0.8 1.1 0.8
0.7 0.6 0.3 0.5 0.2 0.5 0.4 0.7 0.6 0.7 0.5 0.3 0.3 0.6 0.3 0.3 -0.2 0.3 0.2 0.2 0.3 0.0 0.0 0.3 0.2 0.3 0.1 0.4 0.5 0.6 1.0 0.8
0.6 0.7 0.8 0.4 0.3 0.4 0.1 0.2 0.6 0.8 0.8 0.8 0.7 0.4 0.3 0.2 0.2 0.5 0.5 0.1 -0.4 -0.4 -0.3 -0.2 0.0 0.1 -0.1 0.1 0.3 0.5 0.8 0.8 1.0 0.7
0.3 0.2 0.2 0.1 0.1 -0.1 0.1 0.1 0.5 0.6 0.6 0.5 0.4 0.3 0.1 0.0 -0.3 -0.8 -1.1 -1.1 -0.7 -0.4 -0.4 -0.2 0.2 0.4 0.3 0.2 0.3 0.2 0.3 0.4 0.4
0.4 0.4 0.3 0.2 0.4 0.1 0.1 0.3 0.3 0.6 0.7 0.4 0.3 0.1 -0.1 0.0 0.3 0.8 0.4 0.7 0.1 -0.1 0.3 0.2 0.0 0.3 0.3 0.4 0.6 0.4 0.3 0.3 0.3 0.3 0.4 0.3
0.4 0.5 0.2 0.3 0.2 0.2 0.1 0.2 0.4 0.5 0.5 0.6 0.7 0.4 0.3 0.3 0.2 0.4 0.4 0.5 0.4 0.4 0.3 0.3 0.3 0.4 0.6 0.6 0.4 0.3 0.4 0.3 0.2 0.3 0.4
0.4 0.4 0.2 0.2 0.1 0.1 0.0 -0.1 0.4 0.5 0.6 0.7 0.7 0.6 0.4 0.3 0.3 0.4 0.4 0.8 0.7 0.3 0.3 0.3 0.3 0.5 0.6 0.6 0.5 0.4 0.2 0.4 0.3 0.3 0.4
0.5 0.5 0.6 0.3 0.2 0.3 0.0 0.1 0.1 0.3 0.7 1.1 1.0 0.7 0.2 0.1 0.3 0.4 0.6 0.6 0.7 0.4 0.1 0.1 0.1 0.2 0.3 0.2 0.3 0.2 0.2 0.3 0.5 0.4 0.4 0.6
0.1 0.1 0.0 0.0 0.2 0.5 0.3 0.2 0.1 0.0 0.0 0.2 0.3 0.3 0.0 -0.2 -0.3 0.0 0.2 0.0 -0.2 0.1 -0.1 -0.3 -0.1 0.0 0.2 0.2 0.0 -0.3 -0.3 -0.1 0.0 0.1 -0.1 0.1
0.0 -0.1 0.3 0.0 -0.1 0.3 0.4 0.1 0.1 0.2 0.1 0.1 0.2 0.5 0.2 0.0 -0.1 0.2 0.1 0.0 0.0 0.4 0.4 0.3 0.4 0.2 0.3 0.2 -0.1 -0.1 0.1 0.3 0.5 0.4 0.1 0.2
0.4 0.3 0.3 0.1 0.0 0.1 0.2 0.2 0.2 0.2 0.1 0.1 0.1 0.2 0.2 0.0 0.4 0.4 0.5 0.3 0.5 0.4 0.2 0.4 0.2 0.4 0.1 0.3 0.5 0.2 0.1 0.1 0.1 0.2 0.0 0.2
0.3 0.9 0.5 0.3 0.3 0.2 0.4 0.4 0.0 0.3 -0.2 0.2 0.2 0.1 -0.1 0.4 0.1 0.6 0.5 0.4 0.6 0.4 0.4 0.2 0.4 0.3 0.0 0.1 0.5 0.4 0.3 0.5 0.3 0.5 0.2 0.4
0.5 0.8 0.7 0.5 0.2 0.6 0.3 0.6 0.4 0.5 0.4 0.4 0.4 0.4 0.6 1.0 0.7 0.4 0.2 0.5 0.4 0.2 0.0 0.1 0.2 0.2 0.2 0.2 0.0 0.4 0.1 0.0 0.1 0.3 0.4 0.2
0.9 0.4 0.2 -0.1 -0.3 0.0 -0.1 -0.1 0.2 0.1 0.1 0.1 0.5 0.7 0.6 0.3 -0.6 -1.8 -1.9 -1.4 -2.0 -2.1 -2.9 -2.5 -3.1 -2.0 -3.2 -2.0 -2.3 0.6

500 KM SATEMS : MEAN O-B TEMPERATURE DIFFERENCES (DEG C) : 30 TO 50 HPA
APRIL 1994
NOAA-12, USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT

FIGURE 30

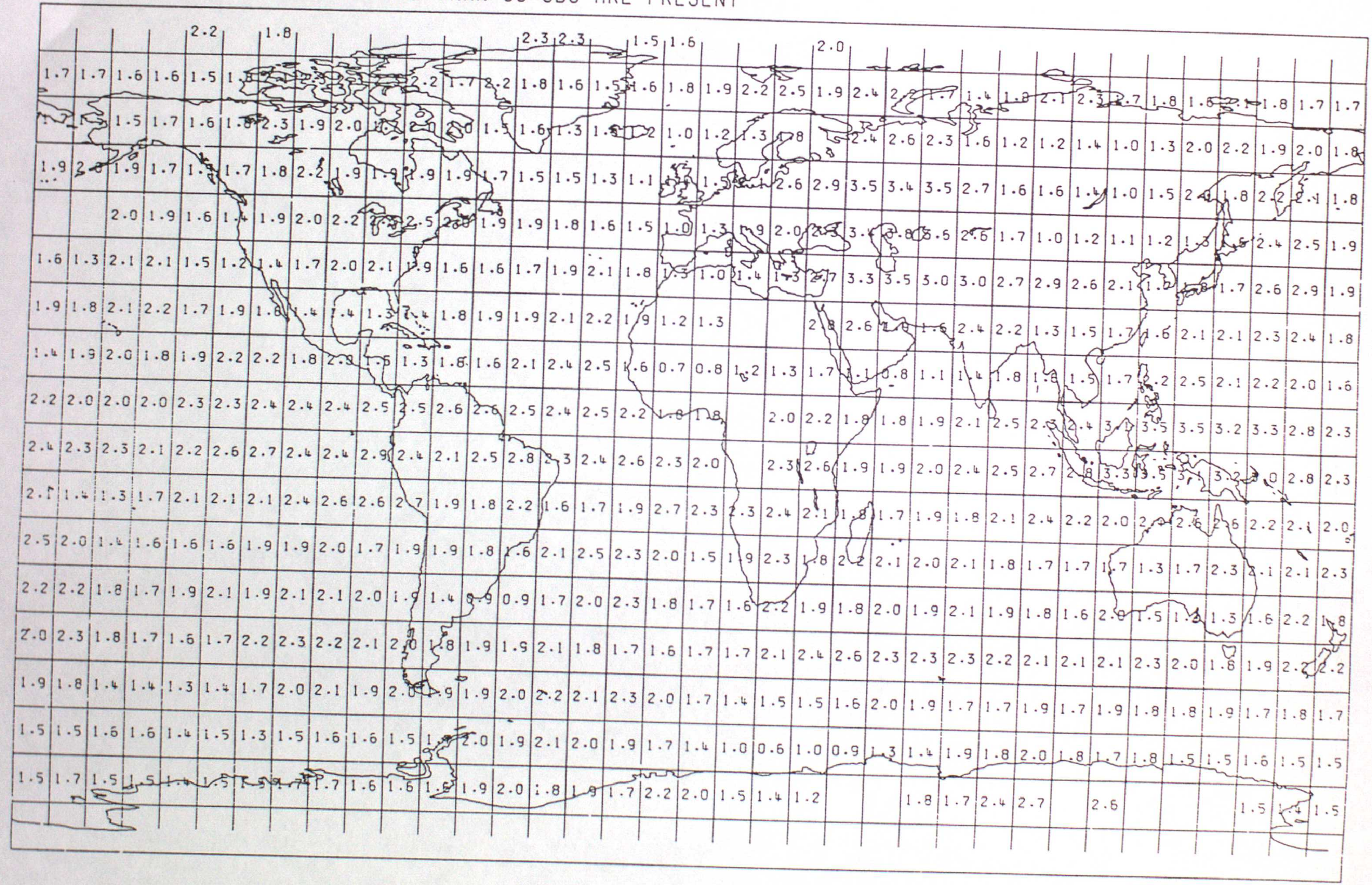


TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures
Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed ($m\ s^{-1}$)
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 $m\ s^{-1}$ (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the wind speed > 3 $m\ s^{-1}$

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA-LEVEL PRESSURE											
13556	25.4	-36.5	ALL	MSLP	SUR	164	0	0	1.2	0.2	1.2
13561	30.0	-24.8	ALL	MSLP	SUR	157	0	0	0.9	0.4	1.0
25551	74.7	-12.9	ALL	MSLP	SUR	14	0	0	2.8	1.6	3.2
25561	56.3	-24.1	ALL	MSLP	SUR	192	0	0	2.4	7.1	7.5
40806	22.5	-55.4	ALL	MSLP	SUR	1	0	0	0.0	-1.2	1.2
41522	25.2	-71.9	ALL	MSLP	SUR	266	0	0	0.9	0.0	0.9
44743	34.8	-36.1	ALL	MSLP	SUR	497	1	0	1.3	0.2	1.3
44760	35.8	-35.3	ALL	MSLP	SUR	340	28	8	1.2	-0.7	1.4
44761	57.3	-21.1	ALL	MSLP	SUR	1355	3	0	1.8	0.1	1.8
44763	55.5	-31.1	ALL	MSLP	SUR	1	1	100	0.0	0.0	0.0
44765	27.7	-53.1	ALL	MSLP	SUR	2	2	100	0.0	0.0	0.0
44767	55.8	-39.2	ALL	MSLP	SUR	256	0	0	1.6	0.6	1.7
44768	51.5	-38.1	ALL	MSLP	SUR	946	5	1	1.5	0.1	1.5
44769	54.0	-31.4	ALL	MSLP	SUR	1384	3	0	1.9	0.0	1.9
44771	52.3	-26.7	ALL	MSLP	SUR	1192	4	0	1.7	0.4	1.8
44777	50.2	-3.8	ALL	MSLP	SUR	6	4	67	0.2	-7.9	7.9
44778	62.7	-12.5	ALL	MSLP	SUR	1496	4	0	1.6	0.1	1.6
62501	42.4	-34.6	ALL	MSLP	SUR	7	0	0	1.0	12.0	12.0
62502	45.3	-3.8	ALL	MSLP	SUR	178	0	0	1.3	0.1	1.3
62503	47.7	-10.0	ALL	MSLP	SUR	328	0	0	1.7	0.8	1.8
62504	48.2	-9.2	ALL	MSLP	SUR	348	0	0	1.2	0.2	1.2
62505	48.2	-12.5	ALL	MSLP	SUR	372	2	1	1.7	0.1	1.7
62506	45.8	-8.8	ALL	MSLP	SUR	497	0	0	1.3	0.1	1.3
62514	40.8	-15.2	ALL	MSLP	SUR	232	0	0	1.1	-0.2	1.1
62524	36.6	-24.0	ALL	MSLP	SUR	954	3	0	0.9	0.2	1.0
62601	20.5	-61.8	ALL	MSLP	SUR	52	0	0	0.9	0.5	1.0
62606	37.6	-9.1	ALL	MSLP	SUR	46	0	0	0.9	0.5	1.0
62695	38.2	-22.8	ALL	MSLP	SUR	572	1	0	0.9	0.1	0.9
62696	59.6	-18.3	ALL	MSLP	SUR	1440	3	0	1.5	0.5	1.5
62711	62.9	-10.1	ALL	MSLP	SUR	986	5	1	1.5	0.4	1.6
64528	62.0	-23.8	ALL	MSLP	SUR	1267	0	0	1.6	0.3	1.6
65581	57.1	-40.0	ALL	MSLP	SUR	22	2	9	2.5	10.7	11.0
65592	62.1	-27.7	ALL	MSLP	SUR	1363	22	2	1.6	0.2	1.6
WIND SPEED											
13556	25.4	-36.5	ALL	SPEED	SUR	507	0	0	1.7	-1.8	2.5
13561	30.0	-24.8	ALL	SPEED	SUR	474	0	0	1.9	-0.8	2.0
40806	22.5	-55.4	ALL	SPEED	SUR	1	0	0	0.0	4.2	4.2
44767	55.8	-39.2	ALL	SPEED	SUR	16	0	0	0.7	-11.1	11.1
44768	51.5	-38.1	ALL	SPEED	SUR	136	1	1	4.0	-9.6	10.4
44769	54.0	-31.4	ALL	SPEED	SUR	109	0	0	4.5	-11.2	12.1
44771	52.3	-26.7	ALL	SPEED	SUR	55	1	2	3.1	-10.7	11.1
62502	45.3	-3.8	ALL	SPEED	SUR	518	0	0	1.8	-0.1	1.8
62505	48.2	-12.5	ALL	SPEED	SUR	69	0	0	1.2	0.4	1.3
62506	45.8	-8.8	ALL	SPEED	SUR	483	0	0	1.6	-0.1	1.6
62696	59.6	-18.3	ALL	SPEED	SUR	43	1	2	3.7	-13.0	13.6
WIND DIRECTION											
13556	25.4	-36.5	ALL	DIRN.	SUR	365	0	0	20.2	8.3	21.9
13561	30.0	-24.8	ALL	DIRN.	SUR	334	0	0	27.8	-4.4	28.2
40806	22.5	-55.4	ALL	DIRN.	SUR	1	0	0	0.0	18.3	18.3
44767	55.8	-39.2	ALL	DIRN.	SUR	16	0	0	5.0	-11.1	12.2
44768	51.5	-38.1	ALL	DIRN.	SUR	112	1	1	71.0	98.2	121.1
44769	54.0	-31.4	ALL	DIRN.	SUR	102	0	0	45.5	85.5	96.9
44771	52.3	-26.7	ALL	DIRN.	SUR	53	1	2	65.9	81.9	105.1
62502	45.3	-3.8	ALL	DIRN.	SUR	376	0	0	19.1	-15.3	24.5
62505	48.2	-12.5	ALL	DIRN.	SUR	69	0	0	12.0	5.9	13.3
62506	45.8	-8.8	ALL	DIRN.	SUR	413	0	0	13.3	-1.1	13.3
62696	59.6	-18.3	ALL	DIRN.	SUR	42	1	2	66.4	96.3	117.0

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in $m\ s^{-1}$

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 $m\ s^{-1}$ Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	881	1	2	2.0	-0.4	877	0	2	0	8.2	1.5
ACA	307	0	2	2.0	-0.3	312	0	1	0	7.5	0.4
AEA	57	5	2	2.6	0.3	58	2	7	0	10.0	-0.5
AEL	201	1	3	2.0	-0.7	201	0	2	0	8.3	1.4
AFL	98	2	100	4.2	2.4	97	2	100	1	15.7	1.1
AFR	432	1	9	1.9	0.0	434	0	9	0	7.7	0.6
AIC	23	35	30	5.2	2.8	23	0	17	0	14.1	-1.8
AMX	187	1	4	2.1	0.2	185	0	3	0	9.6	1.4
ANZ	145	1	3	1.5	-0.7	147	0	5	1	7.1	1.0
AOM	193	1	0	1.7	0.4	194	0	2	0	8.3	1.0
ATN	96	1	4	2.3	-1.6	95	0	15	1	13.4	2.2
AUA	27	0	0	2.1	-1.1	30	0	3	0	11.6	-0.2
AVA	127	2	5	2.3	-0.3	128	1	6	1	9.4	1.2
AZA	304	0	5	2.4	0.8	311	0	4	0	9.3	0.6
BAL	53	0	9	1.9	-0.3	54	0	11	0	7.2	2.0
BAW	533	0	3	2.1	-0.1	537	0	3	0	7.7	1.1
BWA	121	1	4	2.0	0.2	120	1	5	0	11.6	2.0
CDN	455	0	4	1.8	0.3	456	0	6	1	7.5	0.8
CFC	45	2	9	3.0	0.6	45	0	11	0	7.7	1.3
CFG	316	0	100	2.3	-1.3	320	0	3	1	8.7	0.3
CKS	30	3	100	4.1	-0.7	30	13	100	0	22.0	7.3
CLX	41	5	10	2.7	-0.7	44	0	2	0	7.1	0.2
CMM	27	0	7	2.2	-0.8	27	0	7	0	7.9	3.0
COA	147	1	3	2.1	0.9	146	0	3	1	9.3	1.6
CRL	71	4	7	1.9	-0.6	73	0	3	0	8.9	1.4
CTM	21	0	100	3.0	-0.6	21	0	14	0	5.7	1.2
CUB	61	0	8	2.9	1.2	62	0	6	0	10.8	0.8
DAL	1269	1	2	2.1	0.0	1279	0	2	0	8.8	1.7
DHL	139	1	7	3.5	-2.1	137	1	100	0	11.6	0.9
DLH	1413	0	8	2.0	-0.3	1387	0	11	2	7.8	1.4
DOA	51	0	18	1.4	-0.4	52	2	17	0	6.8	1.7
EIA	23	9	17	1.2	-0.3	24	0	13	0	6.4	-0.4
ELY	51	2	4	2.0	0.6	54	2	6	0	8.1	-0.2
FDX	320	0	4	2.0	0.9	327	0	4	1	8.7	1.6
FIN	335	0	0	2.0	0.7	337	0	1	0	8.5	0.6
GAF	37	3	5	2.2	0.2	37	0	11	5	6.8	-0.8
HLF	79	0	100	2.1	-1.3	83	0	2	0	7.4	1.2
HZM	23	4	30	4.6	3.5	23	0	13	0	10.0	-1.1
IBE	592	1	17	2.1	0.3	589	0	18	0	9.5	1.1
ICE	376	1	1	1.8	0.3	369	0	1	0	7.2	0.7
JAL	22	0	0	1.8	0.4	22	0	9	5	8.9	2.5
KLM	910	1	2	1.9	0.1	921	0	2	1	8.2	1.1
LDA	168	2	100	2.3	-1.5	165	0	12	0	9.4	0.1
LDI	54	0	100	2.2	-1.5	53	0	4	0	7.5	1.6
LIB	65	0	2	1.5	-0.5	66	0	0	0	9.4	2.1
LOT	327	0	2	1.9	-0.2	326	1	2	0	8.3	1.2
LTU	373	1	2	1.9	0.2	370	0	3	1	9.2	1.8
MAH	48	0	0	2.2	-1.4	54	0	0	0	9.2	1.8
MPH	267	1	3	2.1	-0.4	267	0	3	1	9.5	1.0
NWA	2193	0	2	2.2	0.7	2235	0	2	0	8.7	1.1
RRR	106	1	18	2.9	-0.9	110	0	19	0	10.5	1.6
SAS	1428	0	1	1.8	-0.1	1424	0	2	2	7.7	0.8
SIA	40	0	3	2.4	0.0	40	0	5	0	9.7	0.8
SJM	20	0	5	3.3	1.5	22	0	5	0	10.4	1.3
SPP	76	1	1	1.8	-0.5	76	0	4	1	9.1	1.0
SVA	101	0	4	2.0	0.4	104	0	4	0	9.2	2.5
SWR	31	3	3	1.2	-0.1	32	0	3	0	8.3	2.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TAP	287	0	2	2.1	-0.4	286	0	3	1	10.0	1.5
TOW	34	0	3	2.2	0.4	39	0	10	3	13.0	-0.1
TWA	724	0	1	2.1	0.2	715	0	3	0	8.6	1.2
UAL	1152	0	3	2.3	-0.3	1171	0	4	2	8.4	0.7
ULE	85	0	2	2.2	-0.1	86	0	1	0	7.9	0.8
UPS	216	0	13	1.8	0.2	216	0	14	0	10.8	1.5
VIA	76	0	0	1.6	0.4	76	0	3	0	9.4	0.4
VIR	25	0	0	1.8	0.3	25	0	4	4	6.9	1.9
BA	10333	0	10	1.9	0.5	10308	0	10	0	7.6	1.5
KL	1681	0	100	2.8	2.3	1681	0	8	0	7.4	0.6
LH	204	1	8	2.4	-0.6	203	0	12	1	14.4	3.4
NW	48	0	0	2.3	1.3	48	0	0	0	5.5	1.2
M	91	7	12	3.4	2.2	95	0	7	1	12.3	0.6
N	197	1	4	2.7	0.3	210	0	7	0	11.2	1.3

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
  WMO  OBS                  NUM    NUM
 IDENT TIME ELM   LEV       OBS   GROSS      SD      RMS     BIAS

 DBLK   00   Z    100        1      0        0.0      7.0     -7.0
 FNOR   00   Z    100       12      0       24.1     27.1     12.3
 FNOR   12   Z    100       14      0       30.9     31.0     -1.1
 FNOU   00   Z    100       15      0       25.7     28.6     12.7
 FNOU   12   Z    100       14      0       18.9     20.2      7.2

 FNPH   00   Z    100       11      0       17.5     17.6     -0.5
 FNPH   12   Z    100       11      0       12.6     19.9    -15.5
 FNRS   00   Z    100       12      0       17.3     25.4     18.5
 FNRS   12   Z    100       13      0       15.7     15.8     -1.9
 GACA   00   Z    100       26      0       18.3     23.9     15.3

 GACA   12   Z    100       26      0       19.2     19.5     -3.2
 JCCX   00   Z    100        1      0        0.0     22.0     22.0
 LDWR   00   Z    100       29      0       15.3     16.4      5.9
 LDWR   12   Z    100       26      0       21.3     21.8     -4.6
 OXYL   00   Z    100       15      0       17.4     24.9     17.9

 OXYL   12   Z    100       13      0       35.9     40.7     19.3
 OZJP   00   Z    100       21      0       20.4     25.0     14.5
 OZJP   12   Z    100       20      0       21.6     29.9     20.7
 P3OO4  00   Z    100       20      0       21.2     24.1     11.3
 P3OO4  12   Z    100       13      0       19.2     28.0     20.4

 P3004  00   Z    100        1      0        0.0     31.0     31.0
 SHIP   12   Z    100        5      0       16.6     23.5     16.6
 SHIPAA 00   Z    100       11      0       16.3     18.2      8.0
 SHIPAA 12   Z    100        7      0       41.0     45.2     19.1
 UQYC   00   Z    100        1      0        0.0     50.0     50.0

 V2LV   00   Z    100        8      0       17.8     19.6      8.3
 V2LV   12   Z    100        8      0       17.7     18.8      6.5
 V2LX   00   Z    100       20      0       28.0     33.2     17.8
 V2LX   12   Z    100       20      0       24.9     31.9     19.8
 ZCAW6  00   Z    100       14      0       75.3     79.1     24.1

 ZCAW6  12   Z    100       12      0       18.1     18.9      5.4
 ZDLG   00   Z    100       13      0       18.2     26.4     19.1
 ZDLG   12   Z    100       16      0       37.7     48.6     30.7
 03953  00   Z    100       28      0       19.4     30.0     22.9
 03953  12   Z    100       26      0       21.1     26.1     15.3

 04018  00   Z    100       27      0       16.4     33.5     29.3
 04018  12   Z    100       28      0       17.6     29.3     23.4
 04220  00   Z    100       29      0       21.7     24.6     11.6
 04220  12   Z    100       29      0       16.0     31.5     27.2
 04270  00   Z    100       27      0       18.5     25.7     17.8

 04270  12   Z    100       27      0       19.1     34.3     28.5
 04339  00   Z    100       28      0       26.2     28.5     11.1
 04339  12   Z    100       27      0       27.3     34.2     20.5
 04360  00   Z    100       28      0       20.2     28.9     20.7
 04360  12   Z    100       29      0       20.0     35.4     29.2

 08001  00   Z    100       23      0       21.1     37.4     30.9
 08001  12   Z    100       23      0       34.4     42.4     24.8
 08508  00   Z    100       26      0       19.9     22.3     10.2
 08508  12   Z    100       28      0       23.5     26.4     12.1
 08594  00   Z    100        1      0        0.0     10.0    -10.0

 08594  12   Z    100       20      0       17.8     23.4    -15.3
 60020  00   Z    100       27      0       24.4     24.5      2.4
 60020  12   Z    100       26      0       25.1     25.6     -5.3
 71600  00   Z    100       28      0       19.9     19.9     -0.6
 71600  12   Z    100       25      0       18.4     38.7     34.0

 72201  00   Z    100       27      0       50.5     61.1     34.5
 72201  12   Z    100       29      0       37.3     52.7     37.2
```

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
72304	00	Z	100	26	0	21.3	32.2	24.2
72304	12	Z	100	29	0	25.8	55.6	49.2
72402	00	Z	100	25	0	37.9	50.3	33.0
72402	12	Z	100	26	0	32.3	67.3	59.0
72606	00	Z	100	25	0	23.7	26.4	-11.6
72606	12	Z	100	29	0	20.4	25.8	15.8
74494	00	Z	100	25	0	26.0	31.3	-17.4
74494	12	Z	100	27	0	24.5	29.3	16.0
78016	00	Z	100	1	0	0.0	7.0	7.0
78016	12	Z	100	23	0	21.0	37.4	30.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

```
 WMO   OBS                 NUM    NUM
IDENT  TIME  ELM   LEV     OBS   GROSS      SD      RMS      BIAS

DBLK    00    Z    500      1      0       0.0     13.0    -13.0
FNOR    00    Z    500     14      0      13.3     14.0      4.5
FNOR    12    Z    500     15      0      15.3     15.6     -3.3
FNOU    00    Z    500     16      0      11.8     13.0      5.3
FNOU    12    Z    500     14      0       9.9     10.5     -3.4

FNPH    00    Z    500     11      0       5.5      6.0      2.3
FNPH    12    Z    500     12      0       7.0      7.2     -1.3
FNRS    00    Z    500     14      0      10.1     10.4      2.4
FNRS    12    Z    500     13      0      14.5     14.9      3.6
GACA    00    Z    500     26      0      17.9     20.1      9.0

GACA    12    Z    500     26      0      14.8     14.9     -1.6
JCCX    00    Z    500      1      0       0.0     10.0     10.0
LDWR    00    Z    500     29      0      14.8     16.6      7.4
LDWR    12    Z    500     27      0      13.8     14.3     -3.5
OXYL    00    Z    500     15      0      10.8     11.2      2.9

OXYL    12    Z    500     14      0      33.8     38.5     18.4
OZJP    00    Z    500     22      0      13.7     14.1      3.1
OZJP    12    Z    500     20      0      11.7     11.8     -1.8
P3OO4   00    Z    500     24      0      14.1     15.3      6.1
P3OO4   12    Z    500     14      0      14.9     15.5      4.6

P3004   00    Z    500      1      0       0.0      9.0     -9.0
SHIP    00    Z    500      1      0       0.0     12.0    -12.0
SHIP    12    Z    500      6      0      14.9     16.4      6.8
SHIPAA  00    Z    500     14      0      11.4     11.4      0.8
SHIPAA  12    Z    500     12      0      15.1     15.4     -3.1

UQYC    00    Z    500      1      0       0.0     36.0     36.0
V2LV    00    Z    500      9      0      10.1     12.8      7.9
V2LV    12    Z    500      9      0      12.3     12.4     -0.8
V2LX    00    Z    500     20      0      14.6     15.2      4.5
V2LX    12    Z    500     20      0      17.0     17.0      0.9

WTEA    00    Z    500      1      0       0.0      5.0      5.0
ZCAW6   00    Z    500     14      0      27.1     27.5      4.2
ZCAW6   12    Z    500     12      0      20.6     26.7    -17.0
ZDLG    00    Z    500     13      0       8.2     17.7     15.7
ZDLG    12    Z    500     16      0       7.7     14.2     11.9

03953   00    Z    500     29      0      20.0     23.2     11.8
03953   12    Z    500     29      0      11.1     11.5      3.0
04018   00    Z    500     29      0      15.1     18.8     11.2
04018   12    Z    500     29      0      15.6     16.4      5.0
04220   00    Z    500     29      0      15.5     17.1      7.1

04220   12    Z    500     29      0      11.8     13.1      5.8
04270   00    Z    500     29      0      12.6     14.6      7.3
04270   12    Z    500     28      0      14.2     18.5     11.8
04339   00    Z    500     28      0      17.9     20.4      9.8
04339   12    Z    500     27      0      12.9     13.8      4.7

04360   00    Z    500     28      0      10.7     11.5      4.2
04360   12    Z    500     29      0      13.1     15.3      7.9
08001   00    Z    500     24      0      21.4     27.7     17.5
08001   12    Z    500     20      0      28.4     29.8      9.0
08508   00    Z    500     26      0      12.2     16.5     11.1

08508   12    Z    500     28      0      22.2     23.3      6.9
08594   00    Z    500      1      0       0.0      8.0      8.0
08594   12    Z    500     21      0       5.6      8.8      6.8
60020   00    Z    500     27      0      20.4     22.9     10.5
60020   12    Z    500     26      0      12.5     13.4      4.6

71600   00    Z    500     28      0      12.2     13.5     -5.6
71600   12    Z    500     29      0      11.8     12.4      3.8
```

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
72201	00	Z	500	28	0	7.2	12.9	10.7
72201	12	Z	500	29	0	9.0	12.2	8.2
72304	00	Z	500	29	0	8.6	9.0	2.4
72304	12	Z	500	29	0	14.9	16.4	6.9
72402	00	Z	500	29	0	18.5	20.0	7.6
72402	12	Z	500	29	0	11.5	18.0	13.9
72606	00	Z	500	29	0	10.4	11.6	-5.2
72606	12	Z	500	29	0	11.6	11.6	0.0
74494	00	Z	500	28	0	8.3	12.8	-9.7
74494	12	Z	500	27	0	10.1	10.6	-2.9
78016	00	Z	500	1	0	0.0	23.0	23.0
78016	12	Z	500	23	0	9.0	17.3	14.8

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBLK	00	V	100	1	0	0	5.7	0.2	-1.5
FNOR	00	V	100	12	0	0	5.7	-1.0	-2.5
FNOR	12	V	100	14	0	0	5.2	-1.8	-1.1
FNOU	00	V	100	15	0	0	4.2	-0.7	-0.5
FNOU	12	V	100	14	0	0	4.2	-0.1	0.2
FNPH	00	V	100	11	0	0	5.0	1.2	0.2
FNPH	12	V	100	11	0	0	3.5	-1.6	0.8
FNRS	00	V	100	12	0	0	2.7	-1.4	0.0
FNRS	12	V	100	13	0	0	4.3	-1.5	-0.7
GACA	00	V	100	26	0	0	3.7	-0.9	-0.1
GACA	12	V	100	26	0	0	3.0	-1.7	0.0
JCCX	00	V	100	1	0	0	2.9	-1.0	-1.8
LDWR	00	V	100	29	0	0	2.9	0.6	-0.5
LDWR	12	V	100	26	0	0	2.2	-0.1	-0.4
OXYL	00	V	100	15	0	0	2.2	-1.3	-0.7
OXYL	12	V	100	12	0	0	2.4	-1.3	-0.3
OZJP	00	V	100	21	0	0	3.1	-0.7	-0.4
OZJP	12	V	100	20	0	0	3.5	-0.8	0.0
P3OO4	00	V	100	21	0	0	3.6	2.8	-1.9
P3OO4	12	V	100	13	0	0	4.5	-0.4	1.1
P3004	00	V	100	1	0	0	2.8	3.2	1.7
SHIP	12	V	100	2	0	0	2.8	3.4	-2.9
SHIPAA	00	V	100	10	0	0	2.8	2.7	-0.7
SHIPAA	12	V	100	7	0	0	3.5	1.4	2.4
UQYC	00	V	100	1	0	100	3.5	0.3	0.8
V2LV	00	V	100	8	0	0	3.8	0.8	-1.8
V2LV	12	V	100	7	0	0	3.8	-3.1	-3.8
V2LX	00	V	100	20	0	0	3.8	1.9	0.1
V2LX	12	V	100	20	0	0	3.7	-0.2	1.3
ZCAW6	00	V	100	13	0	0	3.8	0.5	-1.1
ZCAW6	12	V	100	12	0	0	3.3	-0.3	-0.7
ZDLG	00	V	100	10	0	0	3.0	-2.8	-0.3
ZDLG	12	V	100	14	0	7	3.1	-3.9	-1.0
03953	00	V	100	28	0	0	2.8	-1.0	0.5
03953	12	V	100	26	0	0	3.3	-1.9	-0.4
04018	00	V	100	27	0	0	3.1	0.3	-0.2
04018	12	V	100	28	0	0	2.8	0.1	-1.3
04220	00	V	100	28	0	0	2.6	0.1	1.2
04220	12	V	100	29	0	0	2.7	1.1	0.2
04270	00	V	100	27	0	0	2.6	-0.6	-0.2
04270	12	V	100	27	0	0	2.6	0.5	-0.9
04339	00	V	100	28	0	0	4.0	0.1	-1.6
04339	12	V	100	27	0	0	4.5	-0.5	-1.6
04360	00	V	100	28	0	0	4.2	-1.2	0.5
04360	12	V	100	29	0	0	2.4	-1.7	-0.4
08001	00	V	100	23	0	0	3.8	0.6	0.1
08001	12	V	100	22	0	0	2.9	-1.2	0.8
08508	00	V	100	26	0	0	3.3	0.9	1.3
08508	12	V	100	28	0	0	4.9	0.2	-0.8
08594	00	V	100	1	0	0	4.6	1.6	-2.1
08594	12	V	100	21	0	0	4.6	0.2	3.4
60020	00	V	100	27	0	0	3.0	0.5	0.7
60020	12	V	100	26	0	0	3.8	-2.8	1.4
71600	00	V	100	27	0	0	3.2	-1.0	0.8
71600	12	V	100	23	0	0	2.8	0.7	-0.3
72201	00	V	100	27	0	0	2.7	0.3	0.6
72201	12	V	100	28	0	0	3.7	-0.9	-0.8

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
72304	00	V	100	26	0	0	7.3	-0.9	0.5
72304	12	V	100	29	0	0	4.1	-0.5	0.4
72402	00	V	100	24	0	0	3.5	-0.8	-0.8
72402	12	V	100	25	0	0	3.7	0.4	-0.5
72606	00	V	100	21	0	0	4.4	-2.0	1.0
72606	12	V	100	24	0	0	3.1	0.3	0.1
74494	00	V	100	25	0	0	2.2	-1.5	1.3
74494	12	V	100	26	0	0	3.0	-1.4	0.5
78016	00	V	100	1	0	0	5.1	3.4	0.2
78016	12	V	100	20	0	0	5.1	-0.2	-1.8

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH:April, 94

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
DBLK	00	V	500	1	0	0	3.1	2.6	1.4
FNOR	00	V	500	14	0	0	3.1	1.1	-1.0
FNOR	12	V	500	15	0	0	3.4	1.7	2.1
FNOU	00	V	500	16	0	0	5.7	0.8	-0.7
FNOU	12	V	500	14	0	0	4.2	-0.2	-0.8
FNPH	00	V	500	11	0	0	2.9	0.8	-0.8
FNPH	12	V	500	12	0	0	5.1	-0.9	1.8
FNRS	00	V	500	14	0	0	3.4	-0.6	-1.3
FNRS	12	V	500	13	0	0	3.6	-1.6	0.2
GACA	00	V	500	26	0	0	3.2	-0.1	0.6
GACA	12	V	500	26	0	0	3.1	-0.4	0.3
JCCX	00	V	500	1	0	0	3.8	0.2	-0.2
LDWR	00	V	500	29	0	0	3.8	0.9	-0.4
LDWR	12	V	500	27	0	0	2.6	-0.5	-0.3
OXYL	00	V	500	15	0	0	3.1	0.3	1.1
OXYL	12	V	500	14	0	0	2.7	-1.2	0.1
OZJP	00	V	500	22	0	0	4.0	1.2	-0.2
OZJP	12	V	500	20	0	5	4.5	1.3	-1.8
P3OO4	00	V	500	24	0	0	4.0	0.8	0.7
P3OO4	12	V	500	14	0	0	3.1	0.4	1.3
P3004	00	V	500	1	0	0	2.4	-2.8	1.3
SHIP	00	V	500	1	0	0	2.4	-1.2	1.5
SHIP	12	V	500	4	0	0	2.4	0.7	1.2
SHIPAA	00	V	500	14	0	0	2.4	1.2	-0.6
SHIPAA	12	V	500	12	0	0	3.4	-0.4	-1.0
UQYC	00	V	500	1	0	100	4.3	-1.5	-2.1
V2LV	00	V	500	9	0	0	5.8	-1.6	0.6
V2LV	12	V	500	9	0	0	5.8	-1.5	0.5
V2LX	00	V	500	19	0	0	5.8	0.5	1.2
V2LX	12	V	500	20	0	0	2.8	-0.5	1.7
WTEA	00	V	500	1	0	0	2.6	-0.3	-0.4
ZCAW6	00	V	500	13	0	7	3.0	0.6	-2.6
ZCAW6	12	V	500	12	0	0	5.6	0.5	-0.8
ZDLG	00	V	500	10	0	0	3.1	0.7	-0.2
ZDLG	12	V	500	16	0	12	2.0	-2.7	-1.5
03953	00	V	500	28	0	0	4.0	-0.7	-0.5
03953	12	V	500	29	0	0	3.7	-0.3	-0.6
04018	00	V	500	29	0	0	4.9	-0.9	0.1
04018	12	V	500	29	0	0	4.4	-0.7	-0.6
04220	00	V	500	29	0	0	5.2	0.5	-0.7
04220	12	V	500	29	0	0	2.6	0.2	0.0
04270	00	V	500	29	0	3	3.2	-1.7	0.4
04270	12	V	500	27	0	0	4.0	-1.4	-0.2
04339	00	V	500	28	0	3	3.7	0.3	0.0
04339	12	V	500	27	0	0	4.1	-0.6	-0.9
04360	00	V	500	28	0	0	4.2	-0.9	0.8
04360	12	V	500	29	0	0	2.9	-0.4	-0.3
08001	00	V	500	24	0	0	4.6	-0.3	0.2
08001	12	V	500	19	0	0	2.9	0.0	-0.1
08508	00	V	500	26	0	0	2.7	1.7	1.8
08508	12	V	500	28	0	0	4.4	0.7	-0.4
08594	00	V	500	1	0	0	4.4	-4.6	-1.1
08594	12	V	500	22	0	0	4.4	-1.4	-1.0
60020	00	V	500	27	0	0	3.7	-1.2	-1.6
60020	12	V	500	26	0	3	4.7	-2.4	-1.9
71600	00	V	500	28	0	0	4.4	1.3	-0.3
71600	12	V	500	28	0	0	4.7	1.1	1.0

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
72201	00	V	500	28	0	0	4.1	0.8	0.1
72201	12	V	500	29	0	0	2.9	0.6	-0.6
72304	00	V	500	25	0	0	3.3	0.6	0.9
72304	12	V	500	29	0	0	3.9	0.7	1.6
72402	00	V	500	28	0	0	3.4	2.0	0.5
72402	12	V	500	27	0	0	3.4	1.1	0.9
72606	00	V	500	29	0	0	3.9	-2.3	-0.7
72606	12	V	500	28	0	0	3.2	-0.5	0.2
74494	00	V	500	27	0	0	5.0	-0.6	1.1
74494	12	V	500	27	0	0	2.2	-1.6	1.3
78016	00	V	500	1	0	0	5.2	-3.9	0.6
78016	12	V	500	23	0	0	5.2	-0.3	0.4

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5,10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Tables 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed $m\ s^{-1}$
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45